



MIEMSS

Maryland Institute for Emergency Medical Services Systems

2001 – 2002 Annual Report



MIEMSS: MISSION/VISION/KEY GOALS

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) oversees and coordinates all components of the statewide EMS system (including planning, operations, evaluation, and research), provides leadership and medical direction, conducts and/or supports EMS educational programs, operates and maintains a statewide communications system, designates trauma and specialty centers, licenses and regulates commercial ambulance services, and participates in EMS-related public education and prevention programs.

MIEMSS provides the executive support for the EMS Board in reviewing and approving the budgets for agencies receiving funds from the EMS Operations Fund, developing and promulgating regulations and protocols, proposing EMS system legislation, licensing/certifying and disciplining EMS providers, and conducting other EMS Board business. MIEMSS also provides the administrative and staff support for the Statewide EMS Advisory Council (SEMSAC) and five EMS regional councils.

MISSION

Consistent with Maryland law and guided by the EMS Plan, to provide the resources (communications, infrastructure, grants, and training), leadership (vision, expertise, and coordination), and oversight (medical, regulatory, and administrative) necessary for Maryland's statewide emergency medical services (EMS) system to function optimally and to provide effective care to patients by reducing preventable deaths, disability, and discomfort.

VISION

To be a state EMS system acknowledged as a leader for providing the highest quality patient care and that is sought out to help other EMS systems attain the same level of quality care.

KEY GOALS

- Provide high quality medical care to individuals receiving emergency medical services.
- Maintain a well-functioning emergency medical services system.

2001-2002 ANNUAL REPORT

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FROM THE EMS BOARD CHAIRPERSON



*Donald L. DeVries, Jr., Esq.
Chairperson EMS Board*

The gavel to begin the regular monthly meeting of the Emergency Medical Services Board was poised to fall as news of the horrific events of September 11, 2001, in New York City, Washington, D.C., and Pennsylvania began to unfold. The eleven-member panel, appointed by the Governor to provide the leadership for the coordination of EMS in Maryland, continued through its agenda even as the events and implications of the day's events became clearer. There was a surreal atmosphere that morning, but within the institutional vertigo created by these tragedies, the Board's determination to complete its mission for that morning heightened.

The same determination and dogged diligence to complete the tasks at hand were in evidence everywhere in America. From fire and EMS personnel who responded in the cities attacked by terrorists, to the leadership of the country who cast aside political differences, to the parents and school teachers who comforted the young, to federal, state, and local government who accelerated response and Weapons of Mass Destruction preparations, to virtually all citizens of America, a steely resolve arose.

America may never be the same. None of us will ever forget the events of those days nor the impact of the events on our lives. But arising out of the ashes and smoke that day was a new level of respect for the citizens of our country who serve fellow citizens in times of difficulty and

tragedy. The police, fire and EMS services performed heroically and selflessly that day.

The past year clearly delineated the forces of good and evil, the forces of creation and destruction, of safety and terror. The country and the world were reminded of the ultimate meaning of honor and heroism. In Maryland, we have long been aware of the value of our public safety and EMS services.

Fire and EMS services continue to play an increasingly important role in Maryland. The aging infrastructure of our cities, the graying of our population, the over-reliance on violence to resolve disputes, the combination of volatile weather and urbanization of rural areas, and the heightened awareness of the need for preparation for Weapons of Mass Destruction events have extended the resources of the communities within our state. From the darkened tunnels of Baltimore to the pitch-black skies over LaPlata, fire and EMS services consistently demonstrate their mettle.

The EMS Board honors the memories of those who died on September 11, 2001, and those in public safety, fire, and EMS services who lost their lives in other acts of selfless heroism during the past year. The EMS Board has reaffirmed its commitment to provide the leadership and seek the resources needed to enable these services to continue to respond and serve so effectively. At the same time, I wish to thank my fellow members of the EMS Board and the MIEMSS staff for their commitment to ensuring that Maryland's EMS system remains one of the finest in our nation.



*Robert R. Bass, MD, FACEP
Executive Director, MIEMSS*

FROM THE EXECUTIVE DIRECTOR

The events of the past year leave us breathless. We all will forever recall September 11, 2001. All else seems to be dwarfed by the Armageddon-like events of that clear, early fall day. We mourn the deaths and destruction; we celebrate the honorable deeds and incredible bravery of those who responded. The focus of the nation's attention and priorities immediately shifted; the agenda for EMS was altered. Planning for response to weapons of mass destruction (WMD), mass casualty, and biological warfare events moved front and center.

With a help of a federal grant that MIEMSS received in 1999, Maryland was well ahead of the curve in WMD planning when the events of September 11 unfolded. MIEMSS continues to work with the Maryland Emergency Management Agency (MEMA) and the Department of Health and Mental Hygiene on improving preparation for and response to a WMD event. A "Maryland Health and Medical WMD Response Plan" was already in place on September 11, and our efforts since then have been directed toward implementing that plan. Many of you may have attended the MIEMSS-sponsored conference held in December that provided management and operational information to local jurisdictions and covered state and jurisdictional preparedness for responding to biological, chemical, explosive, or radiological incidents. A second conference

focused on hospital preparedness. Public safety and hospital groups meet regularly to coordinate efforts. The Hospital Committee is finalizing best practices on personal protective equipment for hospital personnel and on decontamination. The public safety work group is focusing on personal protective equipment, implementation of the WMD Plan, and coordination of the public safety and first responder communities. MIEMSS is working with other state agencies to identify and bring in federal support for implementation of various aspects of the plan.

On the state level, Governor Parris Glendening, working with the General Assembly, strengthened the state's ability to prepare for and respond to an emergency. A series of bills were enacted that, among other things, create a Maryland Security Council responsible for coordinating and developing emergency management plans at all governmental levels; clarify the Governor's ability to declare a state of emergency when there is a threat of terrorism, a terrorist attack, or public health emergency; provide participating local jurisdictions with the ability to request emergency assistance from other localities within an Emergency Management Assistance Compact; and expand criminal surveillance laws and standards related to identification cards and drivers' licenses.

MIEMSS is integrating two information technology initiatives to address WMD and mass casualty events. EMAIS, the electronic information gathering tool, is moving toward implementation. Pilot programs will begin shortly. In addition to providing faster, easier data collection and data production and analysis turnaround, EMAIS will provide early warnings about potential biological warfare events as real-time data are evaluated on a daily basis for tell-tale signs of illnesses of unusual proportions.

MIEMSS is also implementing "Facility Resource Emergency Database" (FRED) to improve communications operations. FRED is an Internet-based application that will speed up the gathering and dissemination of critical information during major incidents or mass casualty events. Dispatch centers, field/command units, hospitals, MEMA, and the Department of Health and Mental Hygiene will be able to quickly communicate with the MIEMSS communication center regarding resource availability, resource needs, and other critical information.

There is much more to do, but with the support of our state and federal resources, I am confident that we will be prepared to effectively deal with future events.

Of course, the ongoing efforts of the EMS Board, the Statewide EMS Advisory Council, and the MIEMSS staff continue. Allow me to highlight a few examples of the past year's work detailed elsewhere in the Annual Report that will serve to further develop and refine Maryland's statewide EMS system.

Several national issues will impact Maryland EMS. The Health Insurance Portability and Accountability Act (HIPPA), as originally proposed, imposes a comprehensive set of requirements for obtaining consent to use patient health care information, advising patients of their rights to know the uses made of patient information, maintaining the confidentiality of patient care, and insuring that health care providers and organizations have procedures and personnel designated to educate providers on properly maintaining health care data in accordance with the regulations. In addition, proposed HIPPA regulations would control the format of data sets for transmitting billing information and security requirements necessary to maintain the confidentiality of health care data. Recently proposed amendments would ease the impact of the regulations on EMS. MIEMSS will be monitoring the proposed amendments and keep providers informed of their ultimate impact.

A second federal issue that has an impact on ambulance services relates to federal regulations regarding ambulance restocking. Federal anti-kick-back statutes prohibit knowingly and willfully offering to pay, solicit, or receive remuneration to induce referrals of items or services covered by federal healthcare programs. The ambulance restocking safe harbor regulations are intended to establish restocking procedures in such a manner as to protect both the hospital and provider company from criminal prosecution. MIEMSS is working on a set of voluntary restocking guidelines for hospitals that wish to provide restocking that falls within legal parameters.

The Facility Automated External Defibrillator (AED) Program is expanding rapidly. A list of approved facilities is updated monthly and available on the MIEMSS website. Currently, there are over 300 sites registered to 160 facilities. The AED Task Force meets on a quarterly basis to discuss the public access program.

While the incidence of ambulance diversions continues to grow in Maryland, great strides have been made this year in gaining the interest and involvement of federal and state government agencies in examining the emergency department (ED) overcrowding problem. The Yellow Alert Task Force continues to meet. The voluntary plan now focuses only on short-term mitigation strategies for hospitals and EMS providers. A Long-Term ED Planning Work Group was created as an extension of the Yellow Alert Task Force to focus on global long-term planning issues. It recently released a final report of recommendations for addressing ED overcrowding.

A Geriatric Emergency Medical Advisory Committee has been created. MIEMSS recognizes that assessing and treating geriatric patients often require specialized knowledge and skills that may not currently be part of EMS education. The advisory committee, including participants from the medical, nursing, and EMS disciplines with knowledge, interest, and expertise in the geriatric patient population, will develop a geriatric-specific component to be implemented into the Maryland EMS system.

The new EMT-I curriculum was approved by the EMS Board and became effective July 1, 2001. The EMS Board has also adopted the new EMT-P curriculum. All EMT-P courses since January 1, 2002 have used the new curriculum.

The BLS Committee has created the new EMT-B refresher course. The course contains the 12 hours of required skills content and includes 12 hours of new continuing education. The additional content was derived from data analysis of ambulance runs and educational information and is the result of collaborative efforts between the Maryland State Firemen's Association, the Maryland Fire and Rescue Institute, MIEMSS, and others.

The Maryland Emergency Services Student Application (MESSA) is fully initiated and has enabled the collection of data to track student outcome and cut back on bureaucracy within fire, rescue, and EMS courses.

MIEMSS has completed its effort to transfer ownership of MIEMSS-funded AEDs and monitor defibrillators. Nearly 3000 items with a value of about \$6 million have been transferred to local jurisdictions, affording more flexibility to local EMS agencies when upgrading or trading in old equipment. The matching grant program initiated

this year has proven to be successful. Purchasing dollars for vital EMS equipment has more than doubled, the cost of equipment has been reduced by larger buying power, and local jurisdictions are able to purchase equipment specifically designed to meet their needs.

Before closing, allow me to acknowledge and thank the EMS Board, the Statewide EMS Advisory Council, and MIEMSS' partners on the state level. The Maryland State Police and the R Adams Cowley Shock Trauma Center continue to provide incredible services to the citizens of the state of Maryland and considerable support to MIEMSS and the EMS Board. The Maryland Fire and Rescue Institute continues to provide a wide range of services to the fire and EMS communities, was a full partner in the WMD conferences held in December, and is involved in many of our educational missions. The Maryland State Firemen's Association continues as an effective advocate for its providers and a critical resource to MIEMSS and the various committees and sub-committees of the Board and the Statewide EMS Advisory Council.

In Maryland, and throughout America this past year, EMS and fire services have assumed a more visible level of recognition. Their work, whether related to national catastrophic events or local response, is appropriately being lauded and appreciated. Providing volunteer and career fire and emergency medical services in Maryland is an

honored tradition, one that is knitted into the fabric of virtually all of our rural and urban areas. For many communities, it binds its citizens and is the core of life. For many families, it is a legacy of giving. To the EMS and fire services, thank you. We will continue our efforts to support you in your efforts to serve your fellow citizens.

ADMINISTRATION

Mission: To secure and effectively utilize financial and personnel resources that will enable MIEMSS to meet its goals and objectives in a manner that is consistent with state regulations and policies.

The Administration Office is responsible for the financial, purchasing, and human resources services of MIEMSS.

The finance staff is responsible for accounting processes to ensure that expenditures are in compliance with applicable regulations. The staff develops the budget, tracks and monitors expenditures, and performs year-end closing. The staff tracks special funds and grant funds and administers State Department of Transportation Highway Safety grants.

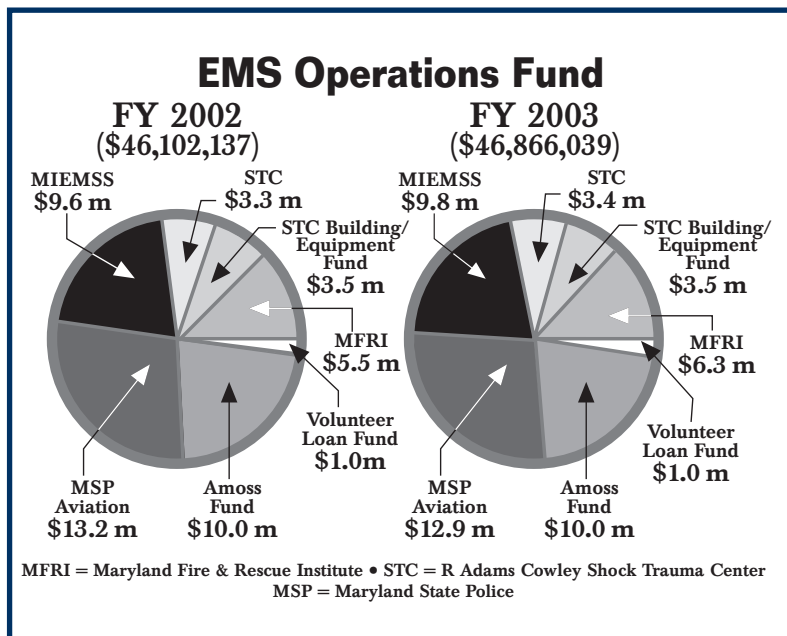
The purchasing staff procures all necessary supplies, materials, and services for the MIEMSS staff. It is also responsible for the timely payment of invoices.

The human resources staff is responsible for recruitment, timekeeping, payroll-related services, benefits and retirement coordination, personnel evaluation processes, and other traditional personnel functions.

The Administration Office is also accountable for inventory control, fleet management, travel services, and building operations and maintenance.

Most administrative, fleet, meeting, and office costs are centrally funded through the Administration's budget.

In FY 2002, the Administration Office was given lead responsibility for and completed two reports requested by the General Assembly. The first report was a plan to expand centralized EMS communications throughout all areas of the state. In addition, the legislature requested an update to the EMS Board's 1997 report on the replacement of the Med-Evac helicopter fleet.



The MIEMSS FY 2002 budget allowance is displayed by state object code and department in the charts on this page.

MIEMSS FY 2002 APPROPRIATION BY DEPARTMENT

Administrative Offices	
Executive Director, Legal Office	\$581,555
Financial & Human Resources Administration	109,201
Planning/Program Development/Total Quality Management	281,065
Communications	
Equipment	1,079,589
Maintenance	1,076,204
EMRC/SYSCOM	896,723
Education/Public Information	
Education, Licensure, & Certification	1,291,431
Educational Support Services	555,186
Emergency Health Services Program	93,500
Information Technology	1,145,453
Medical Services	
Office of Medical Director	592,200
Office of Hospital Programs	94,021
EMS-Children	144,596
Regional Administration	808,366
Commercial Ambulance Program	202,238
Grants	
EMS-Children	100,000
Perinatal Center Designation Program	75,000
TOTAL	\$10,108,328

MIEMSS FY 2002 APPROPRIATION BY OBJECT CODE (INCLUDES SPECIAL FUNDS AND FEDERAL FUNDS)

FY 2002	Actual
Number of Positions	96.1
Salaries and Wages	\$5,885,975
Technical/Special Fees	350,759
Communication	1,573,165
Travel	76,000
Fuel and Utilities	13,500
Motor Vehicle Operation and Maintenance	160,765
Contractual Services	1,568,358
Supplies and Materials	263,500
Equipment-Replacement	44,000
Equipment-Additional	79,000
Grants	25,000
Fixed Charges	68,306
Total Salary and Wages	\$5,885,975
Total Operating Expenses	\$3,871,594
Total Expenditure	\$10,108,328

AEROMEDICAL OPERATIONS

Mission: To provide the physician medical support necessary for the Maryland State Police Aviation Division to meet the emergency helicopter needs of Maryland's citizens. The State Aeromedical Director is actively involved in the ongoing training and verification of skills proficiency for the State Police flight paramedics. He provides around the clock consultation support to SYSCOM for med-evac requests and medical direction and is actively involved in the development of new patient care protocols and the oversight of ongoing care.

In FY 2002 there were 5,384 patients transported by the Maryland State Police (MSP) Aviation Division. Of these patients, 5,070 (94%) were transported from the scene of injury at the request of the local fire services, and 314 (6%) were transported between hospitals to a higher level of care.

Types of calls included the following:

• Motor vehicle crashes	2,671
• Falls	696
• Pedestrians	342
• Gunshot wounds	120
• Burns	97
• Assaults	94
• Industrial accidents	92
• Stabbings	90
• Hand injuries	41
• Drownings	12
• Hyperbaric patients	8
• Eye injuries	7
• Electrocutions	4

Interfacility transports included the following types of patients:

• Trauma	114
• Neonatal	79
• Medical	72
• Perinatal	8

FY 2002 saw the continuation of the Rapid Sequence Intubation (RSI) pilot protocol by the Aviation Division. Designed to address the needs of patients with severe head injuries, the RSI pilot is evaluating the ability of MSP flight paramedics to use neuromuscular blocking agents in the field to allow endotracheal intubation of patients who are not breathing adequately. The pilot protocol has been used by MSP flight paramedics to assist 252 patients to date, with very good results.



Advanced scenario-based training was again utilized for division flight paramedics in joint training exercises with the U.S. Secret Service at the Secret Service training facility. These exercises, which were part of the Advanced Basic Trauma Life Support (BTLTS) certification process, allowed life-like simulation of patient care situations as would be faced by flight paramedics in the course of their normal duties.

FY 2002 also saw the continuation of efforts to computerize the documentation of patient care information. Once complete, this process will better allow for linkage with patient outcome information, thereby giving greater ability to evaluate how best to optimize patient care.

ATTORNEY GENERAL'S OFFICE

Mission: To provide legal advice to the EMS Board, the Statewide EMS Advisory Council, and MIEMSS in connection with all aspects of emergency medical services, the ongoing administrative functions of the agency, and the regulation of commercial ambulance services. The Attorney General's Office also serves as the administrative prosecutor for cases involving allegations of prohibited acts by EMS providers before the EMS Provider Review Panel, the EMS Board, the Office of Administrative Hearings, and the courts.

During the past fiscal year, the Attorney General's Office continued to support MIEMSS in promulgating and implementing the agency's regulations and procurement and contracts, including technology initiatives.

The Attorney General's Office reviewed and prosecuted 34 cases of alleged prohibited acts by EMS providers and applicants.

The Attorney General's Office participated in many committees, task forces, and work groups,

including a work group convened by the Attorney General to study various aspects of the Emergency Medical Services/Do Not Resuscitate Program. The Attorney General issued a report to the Senate Judicial Proceedings Committee and the House Environmental Matters Committee on December 31, 2001, based on the findings of the work group. The Attorney General's Office is now working with MIEMSS to implement the recommended changes. The Attorney General's Office also participated in a work group of Assistant Attorneys General representing several state agencies studying the state's response to bioterrorism and potential legislation regarding bioterrorism. The work of that group resulted in a number of important legislative initiatives, including Senate Bill 234 concerning catastrophic health emergencies. In addition, the Attorney General's Office participated in task forces monitoring the Automated External Defibrillator (AED) program, the Yellow Alert program, and developing EMAIS (Electronic Maryland Ambulance Information System) to replace the current paper runsheet with a computer software application. Other work included advice on ambulance restocking, federal health care privacy regulations, and regional council regulations.

The Attorney General's Office continued to provide education on legal issues affecting EMS, including presentations at EMS Care, the annual Medical Director's Symposium, and Pyramid.

COMMUNICATIONS ENGINEERING SERVICES

Mission: To provide the equipment, support, and expertise necessary to operate the statewide emergency medical services communications system.

MIEMSS Communications continued as an active partner in the State's infrastructure project by providing technical services in the construction of the following towers and microwave.

In Howard County it partnered with the District Court tower and the Dayton State Highway Administration (SHA) tower. Completion of a 28 T-1 digital microwave backbone link from Baltimore to Route 40 to Ellicott City to Cooksville to Mt. Airy provides new high-speed digital connectivity between the State and Howard County.

New towers and medical channel base stations

were also provided in Frederick County at the Mar-Lu Ridge site and the Bridgeport SHA site. Digital microwave continues from the Mt. Airy Army tower to the new Frederick County Law Enforcement Complex, then to the Frederick 9-1-1 center on Montview Lane, then to the MIEMSS tower at Gambrills Mountain. Once this new digital microwave is stable, MIEMSS will start providing Region III EMRC services to Frederick County.

For the northern counties in Region III, MIEMSS Communications Engineering Services installed new digital microwave from Baltimore to Cecil County. This includes connectivity for a new tower in Hereford, to the new Madonna tower, to Hickory (Harford County 9-1-1), to Stoney Forest, to the Lapidum Road tower, then to the new MIEMSS tower at the JFK toll facility on I-95, then to the new MIEMSS Elk Neck tower, and finally to Elkton at the Cecil County 9-1-1 center. New medical channel base station radios were installed at Hereford, Madonna, JFK, and Elk Neck.

New digital microwave was installed in Garrett County to connect the 9-1-1 PSAP to the new Oakland tower.

Several new towers were constructed on the Eastern Shore, including Denton, Snow Hill, and Ocean City. MIEMSS Communications assisted Worcester County with installation of the county backbone microwave to support the new county 800 MHz system.

New medical channel base station equipment was delivered to St. Mary's County to prepare for the county joining the Region V EMRC.

In FY 2002, the Communications Engineering Services Department held two Central Alarm Advisory Council meetings—one in Baltimore, the other in Frederick. In addition, during FY 2002, it

processed 957 service reports, provided 40 new Kenwood TK890 model mobile EMS radios, provided matching funds for monitor/defibrillators and automated external defibrillators (AEDs) totaling \$391,754, and performed 216 ambulance radio inspections.

COMPLIANCE OFFICE

Mission: To ensure the health, safety, and welfare of the public as it relates to the delivery of emergency medical services by Emergency Medical Services Providers throughout Maryland. To that end, the Compliance Office is responsible for ensuring quality of care by investigating complaints and allegations of prohibited conduct.

The Compliance Office works closely with the Provider Review Panel (PRP) panel (the 13-member panel composed of all levels of EMS providers, physicians representing the Board of Physician Quality Assurance and Medical Chirurgical Society, the State EMS Medical Director, and the MIEMSS Executive Director), the EMS Board, and the Attorney General's Office. The PRP reviews complaints, as well as the results of the investigations conducted by the Compliance Office, and recommends to the EMS Board any further action.

ACTIVITY REPORT OF THE INCIDENT REVIEW COMMITTEE (IRC), EMS PROVIDER REVIEW PANEL (PRP), AND THE EMS BOARD

• Incidents Reported to IRC	212
• IRC Investigations Initiated	181
• IRC Investigations Conducted	123
• IRC Investigations Continued	58
• IRC Complaints Forwarded to PRP	34
• Complaints Dismissed by PRP	2
• Complaints Forwarded to EMS Board	32

EMS Board Action

• Reprimands	3
• Probation	7
• Suspensions	2
• Revocations	7
• Remedial training	6
• Surrenders	5
• Evaluation	3
• Applications Denied	3
• Case Resolution Conferences	9
• Dismissed	2





EDUCATION, LICENSURE, AND CERTIFICATION

Mission: To coordinate a variety of services to promote and facilitate the development of knowledgeable, skilled, and proficient emergency health care providers who practice in the Maryland EMS System, including compliance issues, disaster response, and the Critical Incident Stress Management Program.

During FY 2002, the number of career, volunteer, and commercial prehospital providers in Maryland was 30,926, with the following breakdown:

• First Responders	11,339
• Emergency Medical Technicians-Basic	15,891
• Cardiac Rescue Technicians	546
• Cardiac Rescue Technicians-(I)	91
• Emergency Medical Technicians-Paramedic	2,246
• Emergency Medical Dispatchers	813

On July 1, 2001, the Office of Education, Licensure, and Certification fully implemented the Department of Transportation's (DOT) EMT-Intermediate 99 curriculum as the primary curriculum for training all future Maryland CRTs. The curriculum was thoroughly reviewed by the ALS Committee of the Statewide EMS Advisory Committee (SEMSAC) and then forwarded to the EMS Board for approval in May 2001. In addition, the ALS Committee and the Office of Education, Licensure, and Certification developed an 80-hour update course designed to update all existing CRTs to the new scope of practice. The CRT Update Course was piloted in the fall of 2001 and fully implemented in January 2002. All current CRTs will have until 2008 to complete the

update process to the new curriculum.

In addition to the implementation of the EMT-Intermediate 99 curriculum, the Office of Education, Licensure, and Certification worked cooperatively with the Maryland State Firemen's Association (MSFA), the Maryland Fire & Rescue Institute (MFRI), training academies, community colleges, and others to implement the new paramedic curriculum. Effective January 1, 2002, all paramedics preparing for licensure as Maryland paramedics began to be trained with the 1999 DOT EMT-Paramedic curriculum. Existing paramedics will be updated to the content of the new curriculum through the existing continuing education processes. The non-mandatory update information is scheduled to be delivered over four years throughout the state. The ALS Committee compiled a resource CD with various presentations and tools to facilitate the update process at the local level.

In May 2002, the Office conducted the first site visit for the ALS education program approval process. Subsequent to the site visit, the Charles County ALS Education Program was the first program in the State to be approved by the EMS Board. The approval process, as outlined in COMAR 30.04, requires a comprehensive self-study of the educational program and a site visit by outside educators and medical directors. The findings of the self-study and site visit are then submitted to the EMS Board for approval. Charles County received a full five-year approval as an ALS education program.

The Office, in cooperation with the BLS Committee of SEMSAC, designed, developed, and assisted with the implementation of the new enhanced 24-hour EMT-Basic refresher course. Through analysis of data and educational trends, the BLS Committee identified several topics to be covered in the EMT refresher course. The modified content includes specialized topics ranging from pediatrics to geriatrics, special medical devices, adult respiratory emergencies, documentation, and others. The intent of the new content is to provide existing EMTs with updates on current medical information and applicable new information based on the scope of practice for the Maryland EMT-Basic. MFRI, in cooperation with MIEMSS, hosted several instructor rollouts of the new curriculum across the state in May 2002. Implementation of the new curriculum is slated for July 2002.

The Office of Education, Licensure, and Certification, in cooperation with MFRI and the MIEMSS Prehospital Education Quality Improvement Committee, fully implemented the Maryland Emergency Services Student Application (MESSA) and Registry (MESSR). After two years of consensus gathering, needs analysis, and development, the new application and registry are being used with both EMS and fire/rescue classes. The new form is assembled from at least nine different forms and applications and is used to gather needed data for prospective analysis. The committee envisioned the form to decrease paperwork, eliminate repeat data entry, maximize data-capturing abilities, and evaluate progress throughout educational processes. The Office of Education, Licensure, and Certification also worked with the MIEMSS Information Technology Department to develop a user-friendly database, known as the MESSR, where all of the scanned data from the MESSA reside and are analyzed.

EDUCATIONAL SUPPORT SERVICES

Mission: To contribute to MIEMSS' vision of eliminating preventable death and disability by providing to the public essential information on how to recognize an emergency, summon an EMS response, and incorporate injury prevention methods in their daily lives, as well as designing and developing educational programs for EMS providers through state-of-the-art technology.

The Educational Support Services Department provides education and information to the general public, as well as to emergency medical services providers, through training modules and informative programs. The offices of Instructional Production Services, Publications /Public Affairs, and Video Services design, develop, and produce programs that are distributed statewide.

Educational Support Services is responsible for the design and editorial content of the MIEMSS Annual Report, MIEMSS web page, and the *Maryland EMS News*. The newsletter is sent to 28,000 hospital and prehospital EMS personnel six times a year. This keeps emergency medical services personnel in touch with local, state, and national EMS issues. Versions of these documents are also available on the MIEMSS web page. The annual EMS Week and Stars of Life Awards

Ceremony were organized and planned. Press releases were distributed statewide and media coverage obtained on the award winners.

The department provides audiovisual support to MIEMSS-sponsored continuing education programs. These conferences allow providers to update their certification and licensure by attending various regional and statewide programs. Design and production of printed, photographic, and video materials assist the learning process.

Several training modules were produced during the past year. These included "Maryland's Emergency Response to School Bus Incidents for Children with Special Needs," "Pediatric Education for Prehospital Professionals," "Paramedic Update Resource Kit," and the development of a statewide Moulage Program. These modules were produced on compact disc and include printed materials. Video projects included various disaster drill videos and "Emergency Response to School Bus Incidents for Children with Special Needs." Working with the Maryland State Firemen's Association, Educational Support Services staff developed several recruitment initiatives for volunteer providers.

Prevention initiatives were incorporated statewide through participation on the Occupant Protection Task Force, the Motorcycle Safety Task Force, and the Impaired Drivers Coalition, with partnerships among other state and local government agencies. Public service announcements (PSA's) were designed and produced in conjunction with the Maryland EMS for Children Office. Some of the PSA topics included sports and recreational safety, lifejacket usage, farm safety, poison prevention (including publicizing the new national phone number to reach any poison center in the U.S.), and pedestrian safety. In addition to the PSA's, posters were printed on each topic to emphasize main points. Collaboration with the Department of Natural Resources, the Maryland Poison Center, and many local jurisdictions statewide made these projects possible.

EMERGENCY HEALTH SERVICES DEPARTMENT

UNIVERSITY OF MARYLAND, BALTIMORE COUNTY

Mission: To provide leadership in the field of emergency health services through excellence in education. This educational excellence is supported by an active research agenda, service to the University and EMS communities, and provision of professional continuing education. The EHS Department recognizes as constituents the University of Maryland at Baltimore County, MIEMSS, and the Maryland, national, and international EMS communities.

The Emergency Health Services (EHS) Department received a continuation of its contract for the second year with the U.S. Public Health Service to develop and provide training and education for over 8,000 members of the National Disaster Medical System (NDMS). This year's budget is a little over \$ 2 million, with emphasis on creating training for special response teams, including teams focused on surgical, veterinary, mortuary, and international responses to disasters. Headed by Rick Bissell, the EHS team now has over 50 courses completed and available for NDMS members nationwide.

Also on the "disaster front," the EHS Department in the fall worked closely with MIEMSS on planning and staging a mini-course on emergency preparedness for hospital executives from around Maryland. The meeting took place in early December and has resulted in significant hospital activity in disaster planning.

The graduate program welcomed Dr. Donald Alves into the program as its fourth EMS fellow; two fellows now participate in the EHS program simultaneously.

Faculty members Bruce Walz and Dwight Polk worked with student Jason Zahn to submit an article to the *Journal of Health and Social Work* on "Perspectives in child abuse: A study of emergency services providers in the City of Baltimore."

Dwight Polk received the Alumni Association Award for Advising and Mentoring for 2002.

Faculty members Jeff Mitchell, Jason Hums, Matthew Levy, and Dwight Polk provided assistance on-scene and afterwards during the World Trade Center disaster.

To date, EHS has contracts with 26 educational institutions nationwide to provide critical care

transport training utilizing the department's Critical Care Transport Course. In 2001, 634 students, and in the first half of 2002, 240 students, attended Critical Care Transport courses. Sixty-five students have completed the Pediatric and Neonatal Critical Care Transport Course since its first offering in 2001.

EMERGENCY MEDICAL SERVICES FOR CHILDREN

Mission: To provide the leadership, direction, and expertise in the coordination of resources that focus on the unique needs of children and their families in a manner that facilitates the efficient and effective delivery of prehospital, hospital, and restorative care throughout the state. These resources include injury and illness prevention, clinical protocols, standards of care and facility regulation, quality improvement initiatives, interagency collaboration, and initial and continuing education for providers across the continuum of care that will promote the health and well being of children in Maryland.

The Emergency Medical Services for Children (EMSC) Program is responsible for the development of statewide guidelines and resources for pediatric care, the review of pediatric emergency care and facility regulations, coordination of pediatric education programs, and collaboration with other agencies and organizations focused on childhood health and illness and injury prevention. The



EMSC Program coordinates the state Pediatric Emergency Medical Advisory Group (PEMAG), the state Pediatric Quality Improvement Committee, and the five Regional Pediatric EMS Advisory Committees. Federal EMSC grants are coordinated through the Maryland EMSC Program office, involving statewide projects, specialized targeted issues, projects, and research initiatives at academic universities.

The Third National EMSC Congress and Grantees meeting was held in Dallas, Texas in April 2002. At this meeting, Maryland EMSC Program staff presented three poster sessions: "EMS Training for Children with Special Health Care Needs," "ABCs for Kids in Disasters," and "Is Your Family Ready for a Disaster?" These poster sessions were also displayed at the Annual State EMS Medical Directors Symposium and at EMS Care 2002.

The first four-year MCHB/ NHTSA EMSC Partnership Grant was completed with three major objectives. (1) Developing resources for child passenger safety (CPS) education for public service providers and the lay public. Over the grant period, two-day and four-day National Highway Traffic Safety Administration (NHTSA) child passenger safety classes have been offered in all five EMS regions. The grant has established CPS instructors in all five regions that include EMS, fire, law enforcement, public health, and education and nursing professional teams, as well as training kits in collaboration with the Maryland Highway Safety Office. Another component of the Prevention initiative was the development of a "Prevention Information Education Resource" binder and web site for EMS, fire, and rescue personnel. Five posters and five public service announcements (radio and video) were developed in English and in Spanish to promote safety education in the areas of preventing poison, farm, street, water, and sports injuries. (2) Revising the "Children with Special Health Needs" (CSHN) Educational Resource for dissemination in the regions. Equipment and teaching resources kits have been established to support both the CSHN Training Workshop and the Pediatric Education for Prehospital Providers (PEPP) Program. The CSHN workshop has been offered in each of the five EMS regions and for the 2001 and 2002 Maryland School Health Institute. (3) Evaluating available educational programs on the management of the special needs of children in disasters.

Based upon the evaluations in the second year of the grant, the EMSC Program applied for a second EMSC Partnership Grant that will include developing training resources for managing children in disasters.

MIEMSS has been awarded a second EMSC State Partnership Grant from the Maternal Child Health Bureau of the Department of Health and Human Services in joint sponsorship with NHTSA for 2000-2004. This EMSC Partnership Grant has two major focus areas: (1) ABC's of KIDS: Preparing and Planning for the Needs of Children in Disasters and (2) Injury Prevention Initiatives for Children through the Introduction of the RISK WATCH Curriculum from the National Fire Protection Association. A supplemental Trauma and EMS Assessment grant was received by MIEMSS to conduct regional focus groups and complete a national survey on the current resources and need of an inclusive Trauma and EMS system.

The EMSC Program received a Maryland Department of Transportation Highway Safety Grant to initiate an assessment of hospital resources and knowledge on child passenger safety. During the first year of the grant, a survey was conducted with all of the acute care hospitals in Maryland, and child passenger safety technicians were recruited to work with each hospital to improve the networking between safety advocates and hospitals. A second-year grant was awarded to expand the focus to include primary care practices.

The EMSC Program staff and medical directors from PEMAG continued to support PEPP courses and established a PEPP statewide steering committee to facilitate sharing of faculty resources, plan for recertification, and identify material that correlates with the Maryland EMS Medical Protocols. This steering committee meets jointly with the state PEMAG and Maryland chapter's American Academy of Pediatrics' (AAP) Committee on Pediatric Emergency Medicine. PEPP courses have been provided to more than 250 ALS and BLS providers, and 10 pediatric medical directors have completed the course and been approved by the national AAP.

Prehospital continuing education programs were offered at several conferences throughout the state. Pyramid 2001 included a preconference on RISK WATCH and school preparedness for disasters. The EMS Care 2002 state conference includ-



ed a preconference focused on preplanning and preparedness for mass casualty incidents within the school environment. The EMSC program is working jointly with the Region V Office, the Maryland State Police, and the Maryland Emergency Management Agency in the development of a computerized template that will provide a virtual tour of schools to be used by all public safety and school professionals in the planning and response to natural and man-made mass casualty incidents. The Maryland Response to School Bus Incidents with Special Emphasis on Children with Special Needs was completed by the Region V Office and is available on CD-ROM for interdisciplinary training.

MIEMSS actively participates in national, state, and local SAFEKIDS coalitions; the Maryland division of the American Trauma Society; the Maryland Occupant Task Force; and the Child Passenger Safety Board coordinated by the State Highway Administration. This collaboration provides a consistent flow of information to the five regional pediatric committees and the state PEMAG on injury prevention resources and initiatives.

EMRC/SYSCOM

Mission: To provide communication services to assist in the quality of care provided patients in Maryland's EMS System and coordinate the transport of critically ill or injured patients by med-evac helicopter.

In FY 2002, the Emergency Medical Resources Center (EMRC) handled 142,980 telephone calls and 101,851 radio calls. Of these 244,331 calls, 95,316 were communications involving a patient or an incident with multiple patients. During the same time frame, the Systems Communications Center (SYSCOM) handled 70,039 telephone calls and 4,827 radio calls. Of these 74,866 calls, 7,340 were related to requests for med-evac helicopters. However, not all

requests resulted in the transport of a patient. Some requests were canceled by the requestor or were unable to be completed due to weather or other factors.

In addition to quarterly bed status exercises, EMRC/SYSCOM obtained and updated hospital bed status information for National Disaster Medical System (NDMS) in response to the September 11th terrorist attacks.

During the peak hospital alert season, December through March, the hospital alert policy/procedures were modified. The EMRCs collected information on reasons for alerts and required specific names requesting the alerts.

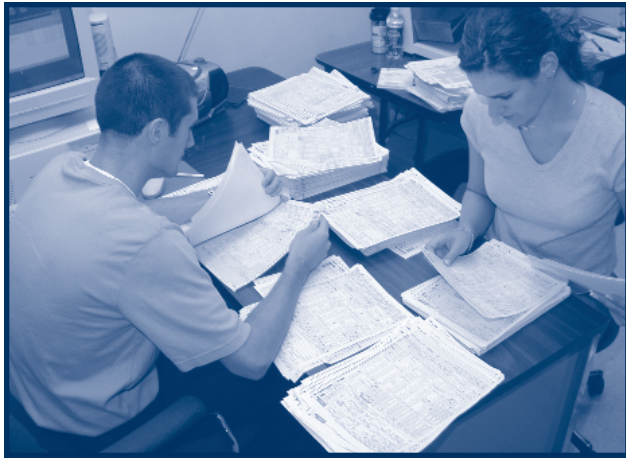
HOSPITAL PROGRAMS OFFICE

Mission: To implement the designation and verification processes for trauma and specialty referral centers, to provide continuing evaluation of these centers for compliance with the regulations and standards in COMAR 30.08 et seq., and to ensure ongoing quality monitoring of the trauma/specialty care system.

The Hospital Programs staff continued to manage and coordinate quality monitoring activities for the trauma/specialty care system. Key components of the ongoing monitoring activities are the trauma registry data analysis, monthly meetings with the Maryland Trauma and Specialty Care Quality Improvement Committee, and case-specific follow-up on consumer complaints.

The office staff have facilitated the work of the Neurotrauma Task Force to develop recommendations for regulations and standards for designation of a Neurotrauma Center. The final draft document has been promulgated and published in COMAR.

The Hospital Programs Office continued to provide support to the Maryland Traumatic Brain Injury Demonstration Project. This grant project is being coordinated through the Maryland Department of Health and Mental Hygiene (DHMH), which is the lead agency for traumatic brain injury (TBI) in Maryland. DHMH is collaborating with the Mental Hygiene Administration (MHA) and the Brain Injury Association of Maryland (BIAM) to implement project activities for training and outreach across the State. The primary purpose of the TBI implementation project is to improve the State's capacity to provide integrated and effective programs and services for per-



sons with TBI and their families, by increasing understanding about TBI, its effects, the needs of TBI survivors and family members, and prevention measures.

The office submitted a grant application to the Health Resources and Services Administration (HRSA) and was awarded a \$40,000 Trauma-EMS Systems State Planning Grant, a development grant for quality improvement projects.

In collaboration with the Emergency Health Services (EHS) Program at the University of Maryland, Baltimore County, the R Adams Cowley Shock Trauma Center, the Johns Hopkins Hospital, and the Johns Hopkins Bayview Hospital, the Hospital Programs Office arranged clinical observation sites and theory courses as part of a six-month, in-depth study of the Maryland EMS/trauma system and trauma nursing for a Hellenic Airforce nurse. This was the fifth Greek Airforce nurse to rotate through this training program.

INFORMATION TECHNOLOGY

Mission: To provide leadership, expertise, and coordination in information systems, data management, networking, and application development relating to emergency medical services systems.

Funding was approved in FY 2002 for EMAIS (Electronic Maryland Ambulance Information System), designed to replace the current paper runsheet with a computer software application. Currently, commercial, paid, and volunteer EMS providers fill out more than 700,000 paper MAIS runsheets each year. EMAIS will save money, improve the quality of the data, and shorten the time to submit data to MIEMSS. MIEMSS published a Request for Proposal for a web-based accessible system and hopes to award a contract before the end of 2002.

The County Hospital Alert Tracking System (CHATS) tracks six different alert types for the hospitals and jurisdictions of Region III and Region V. Those data help identify emergency department overcrowding as it occurs, so that ambulances may be redirected to less crowded facilities, as needed. Participating hospitals and the public are able to view the status of the hospitals at all times via the MIEMSS external web page.

MIEMSS developed a new web-based system called FRED (Facility Resource Emergency Database). This was in response to the 9/11 tragedy. In the case of any type of disaster or emergency, MIEMSS would contact the hospital for a status of available beds. The time for the hospitals to respond would vary, depending on numerous factors, but it could take many hours for all hospitals to respond. FRED allows MIEMSS to send an alert to all hospitals requesting an update on their current status. This includes not only beds, but also staffing and medications, as well as information from the local jurisdictions regarding EMS staffing. FRED will reduce the time it takes to collect this data and make the process more efficient.

MIEMSS began actively pursuing our eGovernment goals in FY 2001. Thus far, CHATS system status can be read from the MIEMSS web page. In addition, MIEMSS staff can access their email via the MIEMSS web page. EMS providers will also find copies of the protocols on-line and can access their individual continuing education reports. Hospitals can update their status via FRED.

The Information Technology Department continued optical character recognition (OCR) scanning during FY 2002 to convert paper records to electronic images. By scanning and capturing images of prehospital care forms, it is possible to link the electronic images of records to the MAIS database. Linking images to database records will make available for review the text portions of the forms that are not otherwise captured electronically. As of June 2002, MIEMSS has successfully OCR-scanned over 1,233,000 MAIS forms.

MIEMSS continues to use its vast data resources to answer many questions regarding EMS care in Maryland. The main access package is a customer-defined system using Microsoft OLAP (On-Line Analytical Processing). This gives our staff the flexibility of looking at our MAIS database from numerous perspectives in a user-

friendly environment. As our database continues to grow with the addition of the EMAIS data, MIEMSS will be better prepared to answer even more questions about EMS in Maryland.

MARYLAND CRITICAL INCIDENT STRESS MANAGEMENT PROGRAM

Mission: To offer psychological support services to firefighters, emergency medical technicians, police, and other emergency services personnel involved in emergency operations under extreme stress, to minimize the impact of job-related stress, and to help accelerate recovery of those persons exhibiting symptoms of severe stress reaction.

The Maryland Critical Incident Stress Management (MCISM) program offers education, defusings, and debriefings conducted by a statewide team of trained volunteers. The team consists of volunteer doctoral or master-level psychosocial clinicians interested in working with emergency services personnel, and fire/rescue/law enforcement peer-support persons trained in the process. Volunteer regional coordinators are responsible for specific geographic areas of the state and serve as the points of contact, through local 9-1-1 centers and SYSCOM, for critical incident stress management.

MEDICAL DIRECTOR'S OFFICE

Mission: To provide leadership and coordination for state medical programs, protocols, and quality assurance, to liaison with the regional programs and clinical facilities, and to promote creative, responsive, and scientifically sound programs for the delivery of medical care to all citizens.

In FY 2002, the Office of the Medical Director and the Regional Quality Improvement Committees worked with each of the EMS operational programs to improve the infrastructure, the quality assurance process, and the quality improvement objectives of each. During that time, each of the EMS operational programs: (1) has had an opportunity to review its existing quality assurance and quality improvement plan to ensure it met current standards; (2) has submitted its written quality assurance and quality improvement plan to the Medical Director's Office; and (3) has had its plan reviewed by and received feedback from the Medical Director's Office. Several EMS

operational programs are currently pursuing extensive quality improvement projects.

The EMS base station course has been completely revised and a CD-based educational program developed with review material and evaluative training tools. The instructor base was expanded to include the regional medical directors and select base station medical directors; this has improved the dissemination of the program. Nine base station courses were offered throughout the state in 2001. Two base stations have had successful site evaluations, including the review of their quality improvement process. In addition, Washington County Hospital was appointed as a new base station.

Coordinating with the Protocol Review Committee, the Medical Director's Office completed a set of revisions for the next update of the Maryland Medical Protocols for EMS Providers. The protocols will be distributed to the jurisdictions for training in early 2003, with statewide implementation scheduled for July 1, 2003.

Revisions to the protocols include:

- Adopting a Chemical and Physical Restraint Protocol, including the use of the medication Haldol
- Instituting a protocol that would allow BLS and ALS providers to administer MARK I Kits
- Creating an option for jurisdictions to allow EMT-Bs to use glucometers
- Allowing the ALS provider to administer morphine to the Do Not Resuscitate patient for pain management
- Altering the Automated External Defibrillator (AED) Protocol to include the new Pediatric AED
- Instituting a Stroke Protocol that would allow an EMS provider to transport a patient meeting specific criteria to a facility other than the closest hospital
- Adding Ipratropium (Atrovent) for the treatment of asthma and COPD

Beginning March 2003, the chemical stockpile at the Aberdeen Proving Grounds will begin its destruction of the 1,600 tons of mustard agent stored at that site. National and local educational programs have been delivered to physicians, nurses, and EMS personnel in preparation of the process. The Chemical Stockpile Emergency Preparedness Program's (CSEPP) medical committees and training committees have completed a

national curriculum that incorporates weapons of mass destruction education with CSEPP specific essentials. All hospitals involved in CSEPP received training and personal protective equipment for their emergency department personnel in the event they need to provide primary and secondary decontamination as the result of a chemical exposure.

In response to requests and questions regarding the COMAR Title 30 regulations, the Office of the Medical Director developed a 90-minute presentation on the impact of the regulations on EMS daily operations. The presentation covers the essential components of the MIEMSS Title 30 regulations that affect the EMS provider in Maryland on a daily basis. The presentation will be offered at conferences and as continuing education throughout the state in the upcoming year.

Throughout FY 2002 the Office of the Medical Director continued to work with the Office of Information Technology to further develop the EMAIS (Electronic Maryland Ambulance Information System). Several presentations of the screen layouts and data points were offered to requesting jurisdictions across the state. The Medical Director's Office coordinated a rural health grant offered by the Maryland Department of Health and Mental Hygiene (DHMH) that would provide the money for hardware to jurisdictions who qualify and agree to participate in an EMAIS pilot program.

The MIEMSS Rapid Response Team (RRT) participated in numerous exercises and emergency response educational programs throughout the country. Members of the team participated in planning, executing, and evaluating disaster exercises at the local, state, and federal levels. Members of the team also assisted with the update of the Maryland Emergency Management (MEMA) statewide Emergency Operations Plan. On September 11, 2001, the RRT was activated to complete a hospital census for the state and begin developing plans for accepting patient transfers. During the anthrax mailings, the RRT was activated to assist DHMH and MEMA with the collection and distribution of information.

POLICY AND PLANNING

Mission: To develop effective policies and innovative strategies to enhance and improve the statewide emergency medical services system.

Yellow Alerts/Emergency Department Overcrowding

The Yellow Alert Task Force meets several times a year to address emergency department (ED) overcrowding and the consequential increasing ambulance diversions.

Specific long-term issues were identified as contributing to emergency department overcrowding. In conjunction with other state health-planning agencies, a report entitled, "Trends in Maryland Hospital Emergency Department Utilization: An Analysis of Issues and Recommended Strategies to Address Crowding" was released in April 2002. The report can be viewed on-line at the Maryland Health Care Commission web-site:

www.MHCC.state.md.us/resources/reports/acute-carehospital/emerdept.pdf. In addition to participating on the Long-Term Planning Work Group,

representatives from MIEMSS and the Yellow Alert Task Force participated in diversion planning meetings that included EMS, hospitals, and health departments from Delaware, Maryland, New Jersey, and Pennsylvania.

MIEMSS continues to monitor statewide alert activity via the County Hospital Alert Tracking System (CHATS) and provides monthly summary reports containing individual facility alert activity to all hospitals.

Lay Person Automated External Defibrillator Program

The Lay Person Automated External Defibrillator (AED) Program has continued to grow throughout Maryland. Under the program, non-health care facilities that meet certain requirements are permitted to have an AED on site to be used by trained lay persons in the event of a sudden cardiac arrest until EMS arrives. Currently, there are nearly 200 approved facilities in the state. A list of AED facilities and program information can be viewed at www.miemss.org/AED.

The AED Task Force dealt with issues related to regulation revisions, as well as strategies for enhanced statewide placement of AEDs. The Task Force was also provided with progress reports from the Office of Epidemiology on the Cardiac Arrest Defibrillation Study.

Geriatric Emergency Medical Services Advisory Committee

As part of an ongoing effort to maintain high-quality emergency medical care, MIEMSS has identified a need for geriatric-specific EMS educational programs, evaluation of geriatric emergency assessment guidelines and treatment protocols, and other relevant geriatric emergency management issues. In order to incorporate a geriatric-specific component into the Maryland EMS System, MIEMSS has established the Geriatric Emergency Medical Services Advisory Committee (GEMSAC), consisting of members with clinical knowledge and expertise in geriatric patient care. The committee's primary responsibilities include the evaluation of current geriatric assessment guidelines, recommendations for geriatric-specific protocol changes, and advisement on EMS geriatric educational curricula in the future.

The committee had its first quarterly meeting on June 26, 2002.

Do Not Resuscitate Program

MIEMSS participated in a working group to study various aspects of the EMS/Do Not Resuscitate (DNR) program. The working group was convened by the Attorney General as a result of Chapter 152 (House Bill 770) of the Laws of Maryland 2000. The report of the working group was submitted to the Legislature on December 31, 2001. The working group devised a comprehensively revised EMS/DNR order form. Use of the new form will be instituted in the upcoming year. As a result of this work group, MIEMSS instituted a change allowing for copies of EMS/DNR orders to be considered valid. That change was effective January 1, 2002.

In further support of the EMS/DNR program, the Office of Epidemiology is conducting an EMS/ Do Not Resuscitate Study in collaboration with the Maryland Attorney General's Office. The purpose of the study is to evaluate the new Maryland law that enables hospital emergency personnel to acknowledge the Maryland EMS/DNR Order as a valid end-of-life directive. The study will also evaluate the effectiveness of the future changes to the current DNR form.

Maryland Cardiac Arrest Public Defibrillation Study

The Maryland Cardiac Arrest Public Defibrillation Study (M-CAPD) was begun in January 2001 by the Office of Epidemiology. It has four main objectives: (1) to identify the epidemiology of sudden cardiac arrest in prehospital settings in Maryland; (2) to evaluate the effectiveness of the Maryland EMS System in responding to cardiac arrests; (3) to determine the impact of the Facility AED Program; and (4) to identify whether there is a need for the State to require that AEDs be placed in certain public locations. Additional information about the study can be found on the M-CAPD website

<http://www.miemss.org/m-capd.htm>. Quarterly reports for statewide data are available upon request.

Weapons of Mass Destruction

Maryland was well ahead of the curve in Weapons of Mass Destruction (WMD) planning when the events of September 11 unfolded. MIEMSS continues to work with the Maryland Emergency Management Agency (MEMA) and the Maryland Department of Health and Mental Hygiene (DHMH) on improving preparation for and response to a WMD event. A "Maryland Health and Medical WMD Response Plan" was already in place on September 11, and efforts since then have been directed toward implementing that plan. MIEMSS sponsored a conference held in December that provided management and operational information to local jurisdictions and covered state and jurisdictional preparedness for responding to biological, chemical, explosive, or radiological incidents. A second conference focused on hospital preparedness. Public safety and hospital groups met regularly to coordinate efforts. The Hospital Committee is finalizing best practices on personal protective equipment for hospital personnel and on decontamination. The public safety group focused on personal protective equipment, implementation of the WMD Plan, and coordination of the public safety and first responder communities. MIEMSS is working with other state agencies to identify and bring in federal support for implementation of various aspects of the plan.

MIEMSS is integrating two Information Technology initiatives to address WMD and mass

casualty events. The electronic information gathering tool EMAIS is moving toward implementation. In addition to providing faster, easier data collection and data production and analysis turnaround, EMAIS will provide early warnings about potential biological warfare events, as real-time data are evaluated on a daily basis for signs of illnesses of unusual proportions.

MIEMSS is also implementing "Facility Resource Emergency Database" (FRED) to improve communications operations. FRED is an Internet-based application that will speed up gathering and disseminating critical information during major incidents or mass casualty events. Dispatch Centers, Field/Command Units, hospitals, MEMA and the DHMH will be able to quickly communicate with the MIEMSS communication center regarding resource availability and allocation.

QUALITY MANAGEMENT

Mission: To support MIEMSS and the EMS community in their continuous quality improvement initiatives and commitment to a customer-based way of doing business. Successfully accomplishing this is not simply dependent upon recognizing that the ultimate customer is a patient in need of timely, proficient, and compassionate care, but understanding and improving the processes that maintain a well functioning EMS system for the delivery of quality medical care.

MIEMSS initiated its quality management implementation through the development of a Juran-based program. Over the years MIEMSS has taken advantage of state supported resources, particularly those offered through the Continuous Quality Improvement and Managing for Results programs, in its efforts to improve upon its services and customer interactions.

Managing for Results (MFR)

Each state agency is required to submit a Managing for Results plan, along with its FY 2004 budget requests, to the Maryland Department of Budget and Management. This phased-in planning process was initiated in 1997 with the submission of MIEMSS Vision, Mission, and Principles statements through a customer-focus strategic planning process. MIEMSS has again met all requirements for state agencies; these include re-evaluation of key goals, subsequent objectives and strategies,

development of associated action plans, and the establishment and monitoring of performance indicators.

MIEMSS has identified two strategic goals and nine associated objectives. Three objectives are outcome oriented, while the remaining six are quality-based indicators. Each objective included performance indicators, which will help both system and jurisdictional quality management initiatives in establishing benchmarks for future quality control and quality improvement efforts.

Goal 1. Provide high quality medical care to individuals receiving emergency medical services.

Objective 1.1 Maryland will maintain its trauma patient care performance above the national norm at a 95% or higher statistical level of confidence.

Objective 1.2 Maryland will reduce its trauma inpatient complication rate by 10%.

Objective 1.3 Achieve x% witnessed sudden cardiac arrest resuscitation upon arrival at the emergency department in x% jurisdictions by 2003.

Goal 2. Maintain a well-functioning emergency medical services system.

Objective 2.1 By 2003, all jurisdictions will use a uniform set of quality indicators for prioritized EMD services.

Objective 2.2 By 2003, average response times to life-threatening emergencies will be less than or equal to 5:59 minutes for basic life support first response and less than or equal to 9:59 minutes for advanced life support in x% of the jurisdictions.

Objective 2.3 Before 2003, x% of jurisdictions will achieve or exceed 90% compliance with pre-hospital provider standards of care per the "Maryland Medical Protocols."

Objective 2.4 By 2002 in Maryland, radio communications from incident location to hospital base station will have a successful completion rate of 95% or more.

Objective 2.5 By 2003, prehospital providers will defibrillate sudden cardiac arrest patients in x% of jurisdictions within an average less than 5:59 minutes.

Objective 2.6 By 2001 in Maryland, at least 85% of seriously injured patients will be transported to a designated trauma center.

Team EMS

An innovative approach to Quality Management education and application in the real world of EMS management was developed in conjunction with the MIEMSS Region V administration. Implemented in 1996 and updated to present standards, MIEMSS staff and a cadre of volunteer presenters from the EMS community offer ways for company and jurisdictional managers to plan for, measure, maintain, and improve quality services. Techniques taught range from brainstorming to data analysis interpretation and include topics from quality improvement team creation to meeting quality assurance standards established under state law. Regional councils have utilized this training for planning purposes and over 75 providers have attended workshops at Pyramid and EMS Care during the year. Emphasis this year was on the development and implementation of individual jurisdictional Quality Assurance/Quality Improvement plans.

EMS Surveillance Measures

Yellow Alert Demand: This past year was marked by an exceedingly high patient demand for emergency room services throughout the state. However, the Baltimore Metropolitan region was hit the hardest. Because of rapidly changing conditions, a daily monitoring of hospital yellow alert status was tracked and thresholds established for voluntary hospital response implementation. The use of this analytical tool enables preemptive modifications in the system to avoid long delays in EMS patient transport and a quicker return to service.

Data Confidentiality

MIEMSS maintains or has access to eight confidential databases used in ensuring quality EMS care delivery. The Confidential Data Access Committee (CDAC) was formed to ensure that all data and information requests were expedited efficiently and accurately, while ensuring patient and provider confidentiality at all times. Since January 2000, over 600 requests have been tracked and facilitated.

Performance Measures/Performance Indicators				
	2001 Actual (%)	2002 Actual (%)	2003 Estimated (%)	2004 Estimated (%)
<i>Outcome:</i>				
≥ 95% statistical level of confidence that Maryland performs above the national norm	yes	yes	yes	yes
Statewide trauma center complication rate	10.0	11.9	9.0	9.0
Percent jurisdictions achieving x% resuscitation (witnessed sudden cardiac arrest)	*	**	**	**
Percent jurisdictions using uniform EMD service indicators	*	0	100	100
Percent jurisdictions meeting both average response time measures (BLS/ALS)	*	**	**	**
Percent jurisdictions with ≥ 90% protocol compliance (Maryland Medical Protocols)	*	*	*	*
Percent EMS radio communications successfully completed with base station	98	98	98	98
Percent jurisdictions with patient defibrillation occurring within an average of five minutes or less	*	**	**	**
Percent seriously injured patients transported to designated trauma centers	86	86	87	88
<i>Note: * Data are not available. ** Indicates that data are being prepared for analysis and available in October 2002. "x %" indicates measurement to be determined of the after data collection and evaluation.</i>				

REGIONAL PROGRAMS

Mission: To provide a liaison between the MIEMSS Central Office and the local EMS agencies, manage MIEMSS programs at the local level, work closely with the local governmental entities, training centers, emergency medical services/fire providers, and staff the Regional EMS Advisory Councils.

Region I

MIEMSS Region I was the recipient of numerous grants for upgrading and enhancing its EMS System. Department of Transportation (DOT) grants, totaling \$66,989, were received for the upgrade of extrication and rescue equipment, medical supplies, scene safety, and training. These grants were coordinated by the Region I Office, Ken May, Bob Shimer, Phil Rook, and Brad Frantz. Five matching grants from MIEMSS were received and used for the placement of 12-lead monitor defibrillators, and eight fire departments received matching grants for automated external defibrillators (AEDs) (total value: \$59,450).

Region I also developed the implementation

County, WMD sections for the county disaster plans were developed and upgraded. Key individuals working on this were Bill Hardy, Dick Devore, Brad Frantz, and Fred Tolla in Allegany County and Rick Bissell in Garrett County.

The Regional EMS Council conducted a Trauma Care Assessment Program in coordination with the MIEMSS Emergency Medical Services for Children Program. The Council adopted the Quality Assurance and Quality Improvement Plan for both Allegany and Garrett counties, and completed a special report on the ALS training issues for the region. The ALS Training Task Force report was geared to improve cost efficiencies of paramedic training in the region. In addition, the Council worked closely with the Allegany County Fire/Rescue Board and the Garrett County EMS Committee on the inspection of ambulances. All first-response ambulance services were inspected and passed, utilizing the State's Seal of Excellence criteria.

Training of EMS providers in the region included special teleconferencing programs arranged by Melissa Meyers of the Western Maryland Health System. Five teleconferencing

programs were conducted, linking the regional EMS providers to the R Adams Cowley Shock Trauma Center in Baltimore. Programs included: The Future of Clinical Practice in the Care of the Injured;

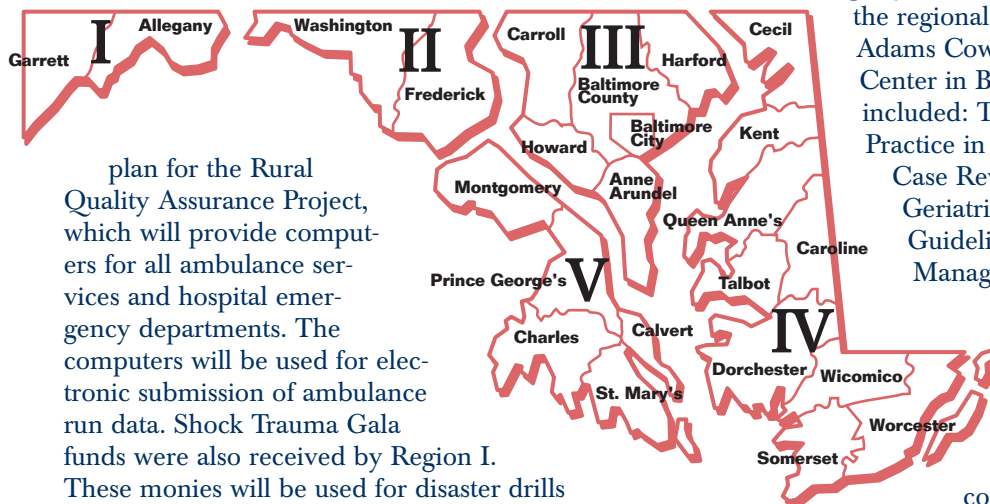
Case Review – Car vs. Tree; Geriatric Trauma Case Review; Guidelines for the Prehospital Management of Traumatic

Brain Injury; and Trauma and Domestic Violence. In addition to these courses, there were a total of 128 continuing education

courses offered by the Maryland Fire and Rescue

Institute, individual EMS companies, Garrett Community College, and the Western Maryland Training Foundation.

Public education about the EMS system and volunteer recruitment efforts were lead by Terry King and Diane Lee from the EMS Council's Public Education Committee. Their efforts included development of special recruitment banners, articles in the newspapers regarding the EMS sys-



plan for the Rural Quality Assurance Project, which will provide computers for all ambulance services and hospital emergency departments. The computers will be used for electronic submission of ambulance run data. Shock Trauma Gala funds were also received by Region I.

These monies will be used for disaster drills in Allegany and Garrett counties, training equipment for the Western Maryland Training Foundation, and educational programs for the quality improvement process in the region.

Both Allegany and Garrett counties have been actively involved with MIEMSS in development of the Weapons of Mass Destruction (WMD) sections for their disaster plans. Under the direction of the Emergency Operating Centers and Health Departments in Allegany County and Garrett

tem, and full-page advertisements recognizing the EMS services in the region during EMS Week.

EMS jurisdictional programs continued to develop. In Allegany County, the Fire/Rescue Board made progress in its reorganization and expansion of duties. The Board was also actively involved in the development of a new ambulance service in eastern Allegany County (District 16 ambulance). In Garrett County, the EMS Committee prioritized DOT grants, coordinated the ambulance inspections, and scheduled a special workshop on EMS/Nursing Home care issues.

Region II

The Region II Office continues to be very active in the Region's Quality Assurance and Quality Improvement programs and participates in all of the Jurisdictional Medical Review Committee meetings. Each jurisdictional committee has streamlined its operations and procedures and now meets at least monthly, or more frequently, as the needs occur. Both tracking and feedback mechanisms have been approved.

The Region II Office coordinated the inspection of 81 EMS response vehicles, including both ALS and BLS ambulances, EMS, engines and special units, and ALS "chase cars."

A significant leadership role was undertaken, with major support provided by Rick Meighen (MIEMSS Region V Office) in the planning, development, operation, and evaluation of a major mass casualty drill at the Hagerstown Regional Airport in April 2002. This drill incorporated several scenarios to meet the requirements of the Federal Aviation Administration, the Local Emergency Preparedness Committee, several police agencies, county government, local trauma center and area hospitals, and the jurisdictional EMS and fire services. The drill included the obvious aircraft crash with approximately 60 casualties resulting from a weapons of mass destruction (WMD) event. Terrorists were involved and the drill escalated into a hostage/barricade situation with several more WMD devices deployed, including hazardous materials, to test the coordination between several police agencies, HAZMAT units, and the local emergency services. MIEMSS Educational Support Services Department videotaped the drill to produce a training program for all participating agencies to use.

The Region II Office coordinated the data col-

lection and assisted with the submission of several Maryland State Highway Administration (Highway Safety Office) grant applications for the region. One of these grants will upgrade an entire jurisdiction's ambulances with new equipment to better treat crash victims. This office also coordinated the regional submission for new/replacement monitors-defibrillators and automated external defibrillators (AEDs) under the MIEMSS Matching and Hardship Grant Program.

In the aftermath of September 11, 2001, the regional office, with the local jurisdictional emergency services, coordinated the development of their local response plans and disseminated information received from MIEMSS and other state and/or federal agencies. A comprehensive survey was conducted of both the jurisdictional and hospital WMD resources, in preparation for a MIEMSS statewide WMD seminar held in December.

In conjunction with the Mid-Maryland Emergency Medical Services Advisory Council, a region-wide meeting was held to conduct an assessment of EMS and trauma care within the region. This meeting was well attended by prehospital EMS providers, hospital administrative and medical personnel, physicians, nurses, police representatives, firefighters, and EMS Council members. The results will be included in a statewide assessment report by MIEMSS.

The Region II Office continues to be actively involved in all aspects of EMS education in the region. Support is provided to both community colleges in the region, which offer both ALS and BLS basic and continuing education classes. Each of these colleges conducted an EMT-Paramedic course this year. The regional office participated in the annual Lifetime in EMS Conference in Washington County, as well as several pediatric case reviews in the region by the MIEMSS EMSC program. This year certification examinations were administered to 5 first responder basic classes and 9 EMT-B classes in the region. In addition, 26 EMT-Paramedic, 24 EMT-B, 6 FRB, and 1 FRR individual examinations were administered in the Region II Office.

On June 1, Washington County Hospital voluntarily suspended its trauma services due to its inability to cover call schedules. The Region II Office worked with the EMS jurisdictions in developing local contingency plans. In the event that ambulances would have to transport patients to

trauma centers or specialty centers in other parts of Maryland, the Region II Office developed a Trauma and Specialty Center Resource booklet that included the name, location, telephone number, and driving directions for all Maryland-approved trauma and specialty referral centers. These booklets were distributed to all ambulance companies in Region II. As negotiations proceeded for the trauma center to reopen, the Region II Office compiled and distributed information to all parties involved and assisted in coordinating meetings.

Region III

Lisa Chervon was selected to replace Harry Wallet who retired after many years as Region III Associate Administrator. Ms. Chervon is a volunteer paramedic with the Bel Air Volunteer Fire Company in Harford County. Prior to joining the Region III Office, Ms. Chervon coordinated First Responder and Emergency Medical Dispatch programs for the MIEMSS Office of Education, Licensure, and Certification.

During rush hour on a weekday in July 2001, a train derailed in the Howard Street tunnel under the downtown Baltimore area and was engulfed in flames. The train was carrying several hazardous materials that threatened the safety of the entire city. Region III personnel responded to the scene, gathered information on the materials involved and distributed it to the area hospitals. The Region III EMS Advisory Council planned to review actions surrounding the incident at their September meeting to determine how hospitals could be better prepared for such widespread incidents. But September 11, 2001 changed those plans.

Prior to September 11, all emergency services personnel in the region had been developing policies to care for victims of terrorist activities or injured by weapons of mass destruction (WMD). A regionwide exercise was in the discussion stage, and increased training in incident management and patient triage and tracking was underway. After the terrorist attacks, all plans and activities were accelerated. The September Council meeting was dedicated to reviewing EMS response to both the train wreck and the terrorists' activities, as well as setting priorities for the future. Priorities identified included improving communication systems to enhance interdisciplinary exchange and scheduling the regionwide exercise.

In November, the Region III Office began working with a programmer to develop an internet-based communication system that had been conceptualized several years earlier and discussed at the September Council meeting. The Facility Resource Emergency Database (FRED) will allow the Emergency Medical Resource Center (EMRC) to communicate with all hospitals and other EMS agencies simultaneously and instantly. It will no longer be necessary to wait for nearly an hour to fax information to all the hospitals in the region. By the end of the fiscal year, the basic program was complete and Region III staff had presented it to every region in the state. It is expected that FRED will be operational by Fall 2002.

Dates were selected for the regionwide exercise, and planning began. The Regional Fall Exercise (REFLEX) was set for an entire weekend in October 2002 and will include four separate scenarios to be linked conceptually by multiple attacks by a domestic environmental activist group. It is hoped that the drill will allow all hospitals and EMS agencies to participate and test policies and procedures set during the year. FRED will play a prominent role in communicating hazardous materials incidents and injuries, bed status, and patient movement.

Although disaster preparedness became a high priority this year, routine business continued. The Region III Office presented EMS Care 2002 at the Maritime Institute for Technology and Graduate Studies the first weekend in May. More than 200 attendees spent some time to dedicate the conference to those lost on September 11 and then heard from those who responded to the World Trade Center and the Pentagon. EMS responders and dispatchers also investigated a variety of other topics on patient care and what the future promises through research and technology.

The Region III Office continued to support educational efforts throughout the year. Most of the region's academies and ALS programs at the Maryland Fire and Rescue Institute are now online with the bar-coding of continuing education credits. Support through the tracking of credits was also provided at most of the major conferences throughout the state. Region III also proctored exams for 37 first responder classes, 39 EMT-B classes, and 4 ALS Protocol classes.

All EMS units in Harford, Baltimore, and Carroll counties and Baltimore City were inspect-

ed this year. Not only ambulances were included in the inspections, but also many ALS chase cars, ALS engines, and first responder units.

Region IV

Wor-Wic Community College, Peninsula Regional Medical Center, the Region IV EMS Advisory Council, and the MIEMSS Region IV Office are working together on an Expression of Interest by Wor-Wic to become a designated advanced life support (ALS) training center. The college is actively involved in scheduling continuing education for EMS providers within MIEMSS Region IV.

The Memorial Hospital at Easton, a MIEMSS-designated ALS training center for the midshore area, and Ocean City EMS, in the lower shore area, conducted CRT-I pilot courses. These two programs were the first in the state.

The following jurisdictions—Talbot, Wicomico, Caroline, and Queen Anne counties and Ocean City—were approved by the State EMS Medical Director to implement a continuous positive airway pressure (C-PAP) pilot program.

Deborah Davis, MD, the Region IV Medical Director, instituted a statewide Quality Assurance/Quality Improvement ALS Provider Intubation Audit Report Form in conjunction with the jurisdictional medical directors.

During this annual reporting period, the following regional hospitals—Atlantic General Hospital, Peninsula Regional Medical Center, and Memorial Hospital at Easton—agreed to provide additional support to ALS prehospital organizations by allowing the installation of EKG data translators and receivers to be located in their emergency departments for the transmission of 12-lead EKGs.

The MIEMSS Region IV administrators inspected 43 prehospital emergency response vehicles, including advanced and basic life support ambulances, chase cars, and first responder units.

Three Physician Base Station Programs were conducted in MIEMSS Region IV during FY 2002. The Union Hospital of Cecil County at Elkton hosted one program, and Memorial Hospital at Easton hosted two programs.

The Dorchester County Commissioners selected its first EMS Director. This was done in support of the countywide EMS plan that was adopted by the commissioners based on a recommendation by the county EMS Task Force.

Each of the region's nine jurisdictions have completed the first phase in the development of

their quality assurance and improvement plans. The jurisdictions will continue working to finalize their plans during the next fiscal year.

The Region IV Office staff assisted in planning and staffing two regional conferences. The Winterfest 2002 EMS Seminar was held January 10-13 at Tilghman Island, and the Peninsula Regional Medical Center Trauma Conference was held at the Ocean City Convention Center on September 22, 2001.

Region V

Pyramid 2001, the thirteenth annual Tri-County EMS Conference, was conducted in conjunction with the Emergency Education Council of Region V, Inc. Held at the Holiday Inn and Conference Center, Solomon's, Maryland, the September conference had 230 registrants. Skill workshops for both ALS and BLS providers included 12-lead EKGs, Self-Defense, Victimization vs. Unintentional Injuries, Airway Skills, and Farm Machinery Extrication. Plenary sessions were presented on "Lessons Learned from the Columbine Tragedy" and "NOAA and Disaster Preparedness."

Following the events of September 11, 2001, Region V staff have been increasingly involved in disaster preparation across the state. The office has provided assistance on mass casualty exercise planning and implementation through both presentations and guidance. Data collected from the exercises are used to improve the drills themselves and, more importantly, actual mass casualty response. Working in conjunction with the Emergency Education Council of Region V, Inc. and the Emergency Medical Services for Children (EMSC) Program, Region V staff developed the Moulage Technician Course. Resources, including vests, emergency tags, and other support materials, are made available through the Region V Office to support exercises statewide.

The Region V Office worked closely with the Health Departments of Montgomery and Prince George's counties in coordinating weapons of mass destruction and bioterrorism planning for hospitals and health care facilities. Planning over the spring and early summer focuses on a series of drills to be conducted on the National Pharmaceutical Stockpile starting in August.

The Region V Office has also been active in prevention and preparedness activities with local school systems. Region V has also worked with the MIEMSS offices of EMSC, the State Medical Director, the Maryland Emergency Management

Agency (MEMA), the Charles County Public Schools, and the Maryland State Police in the development of a template for virtual reality tours of schools for use by public safety personnel in emergency situations. In addition, the "Maryland Response to School Bus Incidents with Special Emphasis on Children with Special Needs" was completed this year. It was previewed at a national transportation conference in Ft. Worth in March and will be implemented in Fall 2002.

Region V continues to support a variety of education and prevention activities through the Region V EMS Advisory Council, county fire and rescue associations, the Prince George's County Safe Kids Coalition and the EMSC RISK WATCH initiative. Shock Trauma mini-grants distributed by the Region V EMS Advisory Council focused on training, including Quality Management and the Pediatric Education Program for Prehospital Providers (PEPP) Program.

The Region V EMS Advisory Council has strongly supported the development of Quality Councils in each county and supported quality management education and implementation. Each county has an operational Quality Assurance/Quality Improvement Plan and the EMS Advisory Council seeks input from these groups in developing new initiatives. One area identified was that of providing care to an aging population. Training in this area is being developed for FY 2003.

Quality Improvement

The Region V EMS Advisory Council has led the state in providing Team EMS training for the last three years through both Shock Trauma grants and Council funds. The Council also supports the Regional Jurisdictional Quality Improvement Council and local quality management projects.

STATE OFFICE OF COMMERCIAL AMBULANCE LICENSING AND REGULATION

Mission: To provide leadership and direction regarding the commercial (private) ambulance industry in Maryland to protect the health, safety, and welfare of persons utilizing these services. This includes the development and modification of statewide requirements for commercial ambulance services and vehicles and the uniform and equitable regulation of the commercial ambulance industry throughout Maryland.

Statistics:

- 143 BLS vehicles licensed
- 112 ALS vehicles licensed
- 7 neonatal vehicles licensed
- 33 licensed ground ambulance services
- 3 licensed air ambulance services
- 29 temporary upgrade authorizations
- 23 complaints received
- 236 number of routine compliance inspections

Number of commercial ambulance transports:

Total ground ambulance transports: 208,134	
BLS	180,517
ALS	26,983
Neonatal	634
Total number air transports: 2,703	

This was the ninth year of operation for the State Office of Commercial Ambulance Licensing and Regulation (SOCALR), a self-supporting department within MIEMSS. Licensing fees that are collected annually are used to support the operation of the department. The number of ambulances licensed had declined by more than 100 between FY 1999 and FY 2001 resulting in decreased revenue to the department. At the end of FY 2002, there were 262 licensed ambulances, an increase of nine from last year.

Inspectors conducted 236 routine compliance inspections, about half the number conducted during previous years. The reduced number is because of the budget limitations. Non-compliance problems were found on 19% of those inspections, with 11 percent being serious violations that required immediate action. Of the 236, 9 or 4% resulted in the temporary suspension of a vehicle license. This year there were 23 complaints alleging various violations. After investigation, four complaints resulted in a non-compliance notice being issued. One service license was denied.

Legislation was passed expanding the definition of ambulance to include air ambulances; this year we licensed three air ambulance services under the statute. Commercial Air Ambulance Service regulations were drafted and are still pending approval.

MARYLAND TRAUMA & SPECIALTY REFERRAL CENTERS

Injured patients need treatment at the hospital best staffed and equipped to meet their special needs. Maryland's system of care ensures that patients promptly get to the most appropriate hospital in an effort to decrease morbidity and mortality. (For differences in standards in the levels of trauma centers, see the Trauma Center Categorization chart on the next page.)

The trauma and specialty referral centers within the Maryland EMS System are:

TRAUMA CENTERS

Primary Adult Resource Center

R Adams Cowley Shock Trauma Center/University of Maryland Medical System, Baltimore City

Level I Trauma Center

The Johns Hopkins Hospital Adult Trauma Center, Baltimore City

Level II Trauma Centers

The Johns Hopkins Bayview Medical Center, Baltimore City
Prince George's Hospital Center, Cheverly
Sinai Hospital of Baltimore, Baltimore City
Suburban Hospital, Bethesda
Washington County Hospital, Hagerstown

Level III Trauma Centers

Western Maryland Health System, Memorial Hospital, Cumberland
Peninsula Regional Medical Center, Salisbury

SPECIALTY REFERRAL CENTERS

Burns

Baltimore Regional Burn Center/The Johns Hopkins Bayview Medical Center, Baltimore City
Burn Center/Washington Hospital Center, Washington, DC

Eye Trauma

Wilmer Eye Institute's Emergency Service/The Johns Hopkins Hospital, Baltimore City
Eye Trauma Center, Suburban Hospital, Bethesda

Hand/Upper Extremity Trauma

The Curtis National Hand Center /Union Memorial Hospital, Baltimore City

Hyperbaric Medicine

Hyperbaric Medicine Center/R Adams Cowley Shock Trauma Center/University of Maryland Medical System, Baltimore City

Neurotrauma (Head and Spinal Cord Injuries)

Neurotrauma Center/R Adams Cowley Shock Trauma Center/University of Maryland Medical System, Baltimore City

Pediatric Trauma

Pediatric Trauma Center/The Johns Hopkins Children's Center, Baltimore City
Pediatric Trauma Center/Children's National Medical Center, Washington, DC

Perinatal Referral Centers

Anne Arundel Medical Center
Franklin Square Hospital Center
Greater Baltimore Medical Center
Holy Cross Hospital
Howard County General Hospital
Johns Hopkins Bayview Medical Center
Johns Hopkins Hospital
Mercy Medical Center
Prince George's Hospital Center
St. Agnes Health Care
St. Joseph Medical Center
Shady Grove Adventist Hospital
Sinai Hospital of Baltimore
University of Maryland Medical System

Poison Consultation Center

Maryland Poison Center/University of Maryland School of Pharmacy, Baltimore City



Trauma Center Categorization

Differences in Standards Based on Physician Availability and Dedicated Resources	PARC	Level I	Level II	Level III
Attending surgeon who is fellowship-trained and is in the hospital at all times	X			
Dedicated facilities (Resuscitation Unit, Operating Room, and Intensive Care Unit) 24 hours	X			
Facilities (Resuscitation Unit, Operating Room, and Intensive Care Unit) available at all times	X	X	X	X
Trauma Surgeon available in the hospital at all times		X	X	
On-call Trauma Surgeon available within 30 minutes of call				X
Anesthesiologist in the hospital at all times and dedicated to trauma care	X			
Anesthesiologist in the hospital at all times but shared with other services		X	X	
On-call Anesthesiologist with CRNA who is in the hospital				X
Orthopedic Surgeon in the hospital at all times and dedicated to trauma care	X			
Orthopedic Surgeon in the hospital at all times but shared with other services		X		
On-call Orthopedic Surgeon available within 30 minutes of call			X	X
Neurosurgeon in the hospital at all times and dedicated to trauma care	X			
Neurosurgeon in the hospital at all times but shared with other services		X		
On-call Neurosurgeon available within 30 minutes of call			X	X
Fellowship-trained/board-certified surgical director of the Intensive Care Unit	X	X		
Physician with privileges in critical care on duty in the Intensive Care Unit 24 hrs/day	X	X	X	
Comprehensive Trauma Research Program	X	X		
Education—Fellowship Training in Trauma	X			
Surgical Residency Program	X	X		
Outreach Professional Education	X	X	X	

Primary Adult Resource Center

R Adams Cowley Shock Trauma Center University of Maryland Medical System

Located in Baltimore City, the R Adams Cowley Shock Trauma Center, which serves as the state's Primary Adult Resource Center (PARC), reported receiving 6,094 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Thomas M. Scalea, MD, FACS, FCCM, serves as the Physician-in-Chief for the Program in Trauma, and Robbi Hartsock, RN, MSN, CRNP, as the Trauma Nurse Coordinator.

The number of fly-bys for the Shock Trauma Center remained the same: two in FY 2001 and two in FY 2002.

Shock Trauma Center staff were very active in prehospital EMS educational activities. Tours were given to 87 groups. Case reviews open to prehospital care providers were held quarterly. One hundred and thirty-eight EMS providers participated in ALS Skills Labs that were offered 14 times. In the Observation Program, over 308 EMS providers observed in the Trauma Resuscitation Unit, and 184 EMS providers in Critical Care. In addition, 65 on-site clinical programs were held at

firehouses, training academies, and EMS conferences.

In the area of clinical education, the R Adams Cowley Shock Trauma Center:

- Actively investigated the use of intravenous fluid and ideal target blood pressure during the evaluation of seriously injured patients
- Collaborated with diagnostic and interventional radiology to define optimal strategy for non-operative management of solid visceral injuries
- Actively investigated optimal resuscitation strategy and alternative therapies in geriatric patients
- Collaborated with orthopedic surgeons to find optimal timing for fracture fixation that involves multiple injuries
- Conducted ongoing investigations for methods for providing organ support in patients whose organs had failed
- Used airway pressure release ventilation in patients with respiratory failure
- Collaborated with neurosurgeons to define optimal resuscitation strategy in patients with severe traumatic brain injuries. This included the utility of jugular venous oximetry, as well as the role of microvascular flow probe and probes that are able to sample biochemical environment in the severely injured brain.

- Investigated the etiology and the ideal therapy for soft tissue infection

The Research Program at the Shock Trauma Center is an integrated multidisciplinary program that seeks to answer important questions concerning issues that affect trauma patients. The R Adams Cowley Shock Trauma Center researchers participate in large national and international multi-institutional projects, and are involved in projects with the National Institutes of Health and the Safar Institute for Resuscitation at the University of Pittsburgh. A Research Education Program continues for residents and fellows who rotate through Shock Trauma.

The Shock Trauma Center provides the leadership for the American Trauma Society, Maryland Division through its president, Robbi Hartsock, RN. Active in all regions in Maryland, the American Trauma Society has sponsored and participated in 100 safety fairs, fire department and hospital open houses, conferences, and conventions and has distributed safety literature to thousands of Maryland's adults and children over the last year.

The Shock Trauma Center Violence Intervention Program (VIP) is designed to identify profiles of patients who are repeat victims of violence in an effort to intervene and disrupt the cycle of violence. The program includes a multidisciplinary approach that combines parole and probation, surgeons, social workers, psychiatrists, nurses, epidemiologists, and physicians who plan care for these patients.

The Shock Trauma Center also participated in the "Mentoring Male Teens in the Hood" program. Sixty males, ages 8-18 years old, visited Shock Trauma to interact with role models from the STC/VIP staff, tour the facility, and participate in small group sessions to reinforce the importance of

staying away from a life of crime. The purpose of this program is to teach young boys to be honest, respectful, and to model positive behavior. The Shock Trauma Center also hosted the Edmondson West Side Summer Camp where 50 ninth graders from Dunbar High School toured the STC and learned about opportunities for pursuing careers in health care.

The High Risk Adolescent Trauma Prevention Program (HRATPP) is an educational program designed to provide information providing the consequences of drinking, taking drugs, and driving so that the participants can make informed decisions about these high-risk behaviors. During FY 2002, 373 high-risk adolescents attended 47 on-site HRATPP programs. In addition, 8 groups from Students Against Destructive Decisions (SADD) brought 80 participants from the metropolitan and Eastern Shore high schools to attend HRATPP programs at the Shock Trauma Center.

HRATPP staff participated in 36 classes and countywide school-related summits. HRATPP conducted related tour programs and taught 36 classes in the community for 817 extremely high-risk adolescents. The HRATPP provided educational displays at various community sites, including schools, community fairs, and conferences reaching thousands of people. They also participated in the Candlelight Vigil for 3-D Month (National Drinking, Driving, Drugged Campaign) and developed a 3-D event held at the University of Maryland Baltimore Campus Student Union, reaching more than 500 people. In addition, they are involved in many of the activities of Baltimore County SADD groups in the elementary, middle, and high schools.

In conjunction with Anne Arundel and Harford county courts and the Office of Parole and Probation, the HRATPP provided 461 educational programs for adult offenders who have driven while intoxicated during this fiscal year.

The Trauma Prevention staff participated in 15 assemblies and 9 health fairs at local high schools, reaching thousands of students. The Trauma Prevention staff also provided instruction during nine ALS recertification programs to more than 300 paramedics.

Level I

The Johns Hopkins Hospital, Adult Trauma Center

Located in Baltimore City, the Johns Hopkins Hospital Adult Trauma Center reported receiving 1,975 trauma patients from June 2001 to May



2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Edward Cornwell, MD, serves as the Director of the Johns Hopkins Adult Trauma Center and Judy Phillips, RN, BS, as its Trauma Nurse Coordinator.

The Johns Hopkins Adult Trauma Center, housed in the *U.S. News & World Report's* designated "#1 Hospital in America," receives nearly 2000 adult trauma patients per year. In 1998 the Adult Trauma Center implemented a 24-hour a day in-house trauma attending surgeon commitment and has quickly demonstrated improved survival, triage time, and length of stay among critically injured patients.

The Johns Hopkins Hospital's Division of Adult Trauma has a strong commitment to trauma prevention, particularly in the area of youth violence. During the past fiscal year, the Adult Trauma Center continued its involvement in several important trauma prevention endeavors. The Hopkins Injury Prevention and Community Outreach Collaborative (HIPCOC), which was established by Dr. Cornwell in 2000, is a multi-disciplinary group of clinicians, hospital, and community affairs professionals, public health professionals, and members of the community who are interested in pursuing violence prevention through educational and outreach activities. During this past fiscal year, HIPCOC continued to conduct several ongoing prevention programs, including: the dissemination of videos aimed at adolescents depicting the true consequences of gun violence; hospital tours to visit the survivors of interpersonal violence; and slide presentations by health care professionals graphically demonstrating the anatomic damage that results from interpersonal violence. In addition, as part of the HIPCOC initiative and with a grant from the American Trauma Society, the Division of Adult Trauma is currently conducting a "readiness to change" study for injured patients ages 15 to 24 who have positive toxicology screens for drugs or alcohol.

As part of his many trauma prevention activities, Dr. Cornwell continued his membership on the Board of Directors of the Police Athletic League (PAL). He is the sponsor of the Fort Worthington PAL center and, in this role, conducts rap sessions and participates in sports activities with adolescents at the center. Dr. Cornwell is also on the Board of Directors of the American Trauma Society and the New Song Community Learning Center.

In the area of clinical research, the Division of Adult Trauma:

- Prospectively studied compliance with sequential compression device (SCD) prophylaxis in at-risk trauma patients. The results of this study were published in *The American Surgeon* (2002).

- Continues to evaluate the effectiveness of 24-hour in-house attending trauma surgeons in facilitating more rapid resuscitation and triage.

- Participated in a multi-center study on hand-sewn versus stapled anastomoses in penetrating colon injuries. The results of this study were published in *The Journal of Trauma* (2002).

During the past fiscal year, the Division of Adult Trauma continued to be actively involved within the trauma community at both the state and national levels. Dr. Cornwell served as Legislative Chairperson for TraumaNet and will assume the position of President of TraumaNet in November 2002. Judy Phillips, the trauma nurse coordinator, continued to serve in the role of chairperson of the state Trauma Quality Improvement Committee.

The Division of Adult Trauma continued to provide educational and community outreach activities within and outside of the hospital setting. During the past year, Dr. Cornwell participated in numerous grand rounds presentations throughout the state. He also presented educational offerings to diverse groups, including area school children, college students, EMS personnel, trauma clinicians, church congregations, and rotary clubs. Within the hospital, the Adult Trauma Education Committee continued to present quarterly trauma continuing education seminars that were attended by nurses, technicians, ancillary staff, and EMS personnel.

Level II

Johns Hopkins Bayview Medical Center Trauma Center

Located in Baltimore City, the Trauma Center at the Johns Hopkins Bayview Medical Center reported receiving 1,318 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Paul Freeswick, MD, FACS, serves as the center's trauma director, Myra Beach, RN, MBA, as its Director of Nursing, Surgery, and Robert Dice, RN, MS, as its trauma coordinator.

Paul Freeswick, MD, FACS was appointed director of trauma. Cleon Goodwin, MD, FACS

assumed the leadership role as director of Burn, Trauma, and Surgical Critical Care. Dr. Freeswick has been an attending trauma surgeon at Bayview for three years. He previously was on staff in the trauma division at the University of Pittsburgh Medical Center—Presbyterian in Pittsburgh, Pennsylvania. Dr. Goodwin was director at the burn center at Brooke Army Medical Center in San Antonio, Texas, prior to coming to Bayview.

During FY 2002, the adult trauma service at the Johns Hopkins Bayview Medical Center (JHBMC) treated 1,318 patients, with a survival rate of 98 percent.

In addition, the adult trauma service at JHBMC strives to minimize the use of trauma bypass, remaining open for all critically or seriously injured trauma patients, while experiencing internal hospital growth in the areas of surgery, orthopedics, and geriatric medicine.

An institutional member of the American Trauma Society, the JHBMC trauma service supports the functions of the local Maryland Division.

The Trauma Center, the Baltimore Regional Burn Center at JHBMC, and the Emergency Department/Department of Emergency Medicine at JHBMC again distributed copies of the pocket version of the Maryland EMS Protocols to volunteer and career prehospital professionals in Baltimore City, eastern Baltimore County, and Harford County.

Plans are underway to revise its trauma team and patient reception protocols to enhance delivery of care to trauma and burn patients received by the Medical Center.

Level II

Prince George's Hospital Center

Located in Cheverly, the Trauma Center at Prince George's Hospital Center reported receiving 2,467 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Philip R. Militello, MD, serves as the Trauma Director and Michael Walls, RN, MSN, as Trauma Nurse Coordinator.

The Prince George's Hospital Center (PGHC) continues to serve as the primary trauma center for the counties of Prince George's, Calvert, Charles, St. Mary's, southern Anne Arundel, as well as parts of Montgomery and Howard counties and the eastern part of Washington, DC.

Approximately 35 percent of last year's trauma totals arrived via helicopter. Three flight agencies routinely use the new rooftop helipad: the Maryland State Police, United States Park Police, and MedStar.

Because of its unique proximity to Washington, DC, PGHC is also a designated trauma center for the White House Medical Team, as well as Operation Capitol. Renovations to the ground-level helipad have been made in order to accommodate the larger helicopters from the military, should the need arise.

Prince George's Hospital Center has affiliated with the R Adams Cowley Shock Trauma Center in Baltimore and regularly rotates a team of senior trauma fellows through PGHC as part of their fellowship training. This serves to enhance their clinical experiences and provides PGHC with additional resources for its growing trauma program.

PGHC continues to host its award-winning trauma prevention program—the Shock Mentor Program—which provides a unique educational experience to students within the Prince George's County high schools. The Trauma Center is also actively involved in hosting the "Reality" program monthly and served as an intervention for a troubled teen-ager on the Judge Hatchett television program. In addition, PGHC is an active participant in the Juvenile Justice System within Prince George's County.

Level II

Sinai Hospital Trauma Center

Located in Baltimore City, Sinai Hospital Trauma Center reported receiving 771 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Adrian Barbul, MD, FACS serves as the Trauma Director, and Jocelyn Farrar, RN, MS, CCRN, ACNP as the Trauma Coordinator.

During FY 2002 Sinai Hospital's trauma center was actively engaged in community outreach and trauma prevention endeavors. An initiative addressing geriatric injury prevention was launched as the Trauma Division partnered with Lifebridge Community Health Education to provide fall and injury prevention education and balance assessments at senior centers and elder care communities. In addition, the American Trauma Society's Traumaroo pediatric injury prevention

series was provided at local elementary schools and health fairs. Sinai's Family Violence Program continued its efforts to break the cycle of violence by providing counseling, resources, referrals, and training of health care providers.

A new trauma coordinator, Jocelyn Farrar, RN, MS, CCRN, ACNP, was appointed to serve the trauma program. Ms. Farrar comes to Sinai Hospital with extensive experience in trauma care. She has published and lectured on the topics of multiple trauma and the care of families of trauma patients. She has also served as a trauma clinical nurse specialist and educator and as faculty in trauma/critical care graduate nursing education.

Performance improvement activities enhanced the care provided to the trauma patient. Focused multidisciplinary performance improvement committees addressed issues such as pediatric trauma patient transfer, aspiration prevention, trauma documentation, and processing of trauma labs. Bypass time was significantly reduced and clearer trauma designation criteria enhanced trauma triage capabilities. A newly revised competency-based trauma education program refined the skills of the nursing teams in the resuscitation area. Computer-assisted adjustments in environmental temperature of the trauma bay reduced the likelihood of hypothermia during resuscitation. In the ICU, an enhanced Continuous Renal Replacement Therapy (CRRT) program benefited trauma patients experiencing renal failure.

Emergency medicine and trauma staff were actively engaged in EMS educational activities. Continuing education courses and case reviews were offered to the EMS community. In addition, preceptorship of paramedics was provided in Sinai's ER7. In an effort to recognize the expertise of the EMS providers, letters of commendation were sent to those who demonstrated clinical excellence in the field.

Research in trauma care was advanced at the state level as the TraumaNet Research Committee convened with Dr. Barbul serving as chair and Ms. Farrar as co-chair. The multidisciplinary group will explore outcomes of geriatric trauma patients cared for at trauma centers versus those cared for in community hospital settings. In addition, Dr. Barbul continues his research in nutrition and wound healing. The research lab has four fellows and one PhD-prepared researcher actively engaged in basic and clinical research. Over 10 publications have resulted from this work, as well as numerous presentations at national and international meetings.

Level II

Suburban Hospital

Located in Bethesda, the Suburban Hospital Trauma Center received 1,252 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Daniel Powers, MD, FACS, serves as the Medical Director of Suburban Hospital's Trauma Services and Anne Kuzas, RN, as its Trauma Nurse Coordinator.

During FY 2002, Suburban Hospital welcomed new executive leadership to the organization. Brian Gragnolati, President/CEO, joined the organization in November 2001. He most recently served as President and CEO of York Hospital in Pennsylvania, a Level I Trauma Center. Glenda Brogden, a seasoned nurse executive with 22 years experience, accepted the role of Senior Vice President of Patient Care Services. Gene Corapi, Senior Vice President of Operations, joined the senior management in March 2002 with a wealth of experience in areas of operations improvement, redesign, and patient access enhancement.

Suburban Hospital has implemented a new Picture Archiving and Communication System (PACS) to bring its physician community "radiology at e-speed." This cost-effective technology has been implemented in the trauma bay to speed diagnoses, reduce time to treatment, and improve patient care.

Through the efforts of a multidisciplinary team, trauma bypass hours have been reduced by more than 80%. This has been accomplished through administrative support, policy modifications, and staff education. This improvement has enabled Suburban's Trauma Center to be more available to serve the trauma care needs of citizens within its immediate community and serve as a backup trauma center as needed within the statewide trauma system.

The Medical Director of Trauma Services and the Trauma Nurse Coordinator continue to actively participate in the Maryland EMS System through memberships in the TraumaNet, the Trauma Quality Improvement Council, the Region V EMS Advisory Council, the Statewide EMS Advisory Council, and the Maryland Division of the American Trauma Society. Suburban is an institutional member of the American Trauma Society. Its staff have also participated in public media events to educate the community about "Red Light Running" and pedestrian safety.

Two four-hour seminars, "Update on Critical Issues in Trauma," were held in the fall and spring. These seminars were offered free of charge to the trauma care community within Maryland, including medical and hospital staff and the EMS community. Emergency department nurses provided an injury prevention program, ENCARE (Emergency Nurses Cancel Alcohol-Related Emergencies), as well as alcohol poisoning lectures in community high schools.

Level II

Washington County Hospital Trauma Center

Located in Hagerstown, the Washington County Hospital Trauma Center reported receiving 698 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Marc E. Kross, MD, PhD, FACS, served as the Trauma Director, and Lorna Christian, RN, as the EMS/Trauma Manager.

During the last fiscal year, the Trauma Center at Washington County Hospital provided trauma services to Washington County residents and to residents from Maryland's Frederick County, Pennsylvania's Franklin County, and West Virginia's Berkeley County.

Throughout the year, the Trauma Center staff has been active in community education events. They have participated in community health fairs, served as speakers about safety issues, and participated in the Stop Red Light Running initiative. Trauma Center representatives have presented case studies to area EMS providers. In December 2001, they also displayed information on safe gifts (smoke detectors, escape ladders, CO2 detectors, safety seats) for employees.

In April 2002, the Washington County Hospital Trauma Center participated in the planning, execution, and critique of the countywide disaster drill initiated by the Washington County Airport. The trauma staff continues to provide trauma-related education to physicians and other staff members on a quarterly basis. Trauma Center representatives have been working with community members to plan an awareness program, Citizen's Emergency Preparedness Day, to be held during the next fiscal year. The team also is in the

process of preparing for a new CT scanner—Sensation 16 by Siemens—that will improve the speed of the process as well as image quality.

To celebrate the outstanding contributions of trauma center staff throughout the hospital, the center organized Trauma Team Recognition Day. Members of the trauma team were invited to a reception. Displays about trauma services and appropriate safety seat use were set up in the hospital lobby. Employees and staff learned about the multidisciplinary approach to providing trauma services.

On June 1, 2002, Washington County Hospital voluntarily suspended its trauma services due to the inability to cover call schedules. A hospital task force has been established to resolve the physician coverage problems and to develop a long-term model to maintain stability for the program.

Level III

Peninsula Regional Medical Center Trauma Center

Located in Salisbury, the Peninsula Regional Medical Center (PRMC) Trauma Center reported receiving 851 trauma patients from June 2001 to May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Un Y. Chin, MD, serves as the Trauma Director, and Lisa Hohl, RN, BSN, CCRN, as the Trauma Nurse Coordinator.

As of May 2001, the Trauma Service has been under the medical direction of Dr. Un Y. Chin. A graduate of the George Washington University Medical School, he completed his residency in general surgery at George Washington University Medical Center. He is board-certified in general surgery and a diplomate of the American College of Surgeons. Under his guidance, Peninsula will apply for redesignation as a level III trauma center.

Peninsula Regional Medical Center continues to coordinate and participate in community-based injury prevention initiatives. For the second year, Peninsula worked closely with the Ocean City Pedestrian Task Force Committee to decrease pedestrian related injury. Additional injury prevention efforts continue with the Maryland Division of the American Trauma Society and the statewide "Stop Red Light Running" initiative, and the

Wicomico and Worcester County Injury Prevention Committees. SafeKids has been the topic for target initiatives with the county injury prevention programs.

Peninsula Regional Medical Center continued to assist in planning, coordinating, and sponsoring several educational conferences:

- It coordinated and sponsored the 12th annual "Topics in Trauma" conference, with topics ranging from prehospital care to advanced inpatient trauma care. Over the years, this conference has grown in size, providing needed continuing education for the region. This year the conference was expanded to two full days and an EMS track was added for prehospital providers' continuing education needs.
- It collaboratively worked with the Brain Injury Association of Maryland, Healthsouth, and Wor-Wic Community College to plan and implement a "Living with Brain Injury: Challenges and Creative Solutions" seminar. This one-day course was geared to professionals who work with survivors of brain injury and families of survivors, to increase awareness of brain injury and its aftermath, and to identify appropriate brain injury treatments, services, and supports.

Peninsula Regional Medical Center continues its organ procurement program collaboratively with the Transplant Resource Center of Maryland. Peninsula participates with the Transplant Recipient International Organization through a local community liaison who is a recipient of a liver transplant. A community education program and a support group for both recipients and families of donors have been developed for those living on the Eastern Shore. During FY 2002, Peninsula participated in the second annual Donor Remembrance Day. This event was held to give the donor recipients and families of donors the opportunity to meet one another in person. In addition, educational information has been developed this year for local high schools to increase awareness and support for students who may be involved with friends or families of organ donors.

Peninsula Regional has worked collaboratively with Wor-Wic Community College in providing continuing education for prehospital providers, as well as curriculum management and coordination of the EMT-B and the EMT-P programs. Geriatric and Pediatric Skills Update was one of the first continuing education programs held on the Wor-Wic campus. This gave EMS providers the oppor-

tunity to review and advance their skills for these special populations. Wor-Wic will coordinate the didactic portion of the EMT-paramedic program, and Peninsula will be one of the sites for the clinical portion of the program, with its EMS liaison functioning as the clinical instructor and supervisor. This will give EMTs the opportunity to practice needed skills in an acute care setting.

Level III

Western Maryland Health System— Memorial Trauma Center

Located in Cumberland, the Western Maryland Trauma Center reported receiving 483 patients from June 2001 until May 2002, according to the Maryland Trauma Registry. (See pages 40 to 45 for patient data in various categories.) Juan Arrisueno, MD, serves as the Trauma Director, and Melissa Meyers, RN, is the Trauma Nurse Coordinator.

The Western Maryland Health System (WMHS)—Memorial Trauma Center continues to focus on community injury prevention programs. WMHS works cooperatively with the Allegany County Health Department, local law enforcement agencies, and other organizations to promote child passenger safety issues. Seven WMHS staff members are nationally certified as child passenger seat technicians and participate in local child passenger safety seat checks in the community, including one this past fiscal year at Memorial Hospital and another at the WMHS Health Fair in April 2002.

The Trauma Nurse Coordinator organized a variety of community activities for National Red Light Running Week in September 2001. Radio and print ads were used to discourage drinking and driving at various holidays during the year, as well as during prom season. Traumaroo, the mascot from the American Trauma Society, also visited with many children in the area to stress the importance of safety.

The use of the telemedicine equipment at the WMHS—Memorial Trauma Center continues to increase. In addition to being available for patient consults, the telemedicine equipment is used to present the Shock Trauma Center's Grand Rounds to physicians, nurses, and EMS personnel in Region I. FY 2002 topics included prehospital management of traumatic brain injury, geriatric trauma case review, trauma and domestic violence, and future clinical practice in the care of the injured.

Emergency and critical care nurses at Memorial Hospital had an opportunity to "shadow" nurses at the Shock Trauma Center through an innovative program developed by the Trauma Nurse Coordinator. The nurses spent time observing different units at Shock Trauma and were able to bring new ideas back to the WMHS–Memorial Trauma Center that help enhance patient care. It also gives the Cumberland-based nurses a better understanding of the Shock Trauma Center and its practices and is resulting in improved continuity of care for those patients who are transferred between the two trauma facilities.

Disaster preparedness efforts increased significantly in Western Maryland after the tragic events of September 11. WMHS updated its disaster preparedness plan and increased its level of preparedness by purchasing freestanding decontamination showers to meet potential on-site decontamination needs. Staff from the WMHS–Memorial Trauma Center participate in the disaster planning efforts for Allegany County and the State of Maryland and also work closely with the Allegany County Board of Education as it finalizes its disaster readiness plan.

Baltimore Regional Burn Center Johns Hopkins Bayview Medical Center

The Baltimore Regional Burn Center manages approximately 300 inpatients each year. About one-fourth of those patients are children. In addition, 1400–1500 ambulatory patients are treated in the Burn Clinic annually. Patients are also seen directly in the Emergency Department and can be followed up in the Burn Clinic as necessary. Because of the complexity of burn care, a multidisciplinary staff is required. Cleon Goodwin, MD, FACS is the Director.

During the past two years, the Baltimore Regional Burn Center has been under the interim direction of Robert Spence, MD. On July 1, 2002, Cleon Goodwin, MD, assumed directorship of the Burn Center. Previously he was director of the Burn Center at Brooke Army Medical Center in Texas. He is highly experienced in treating both adult and pediatric burn patients. Dr. Goodwin has also been a past president of the American Burn Association. At the Johns Hopkins Bayview Medical Center, he also assumed the directorship of the Wound Center and the Trauma Service.

In FY 2002, the Burn Center treated 310 patients as inpatients. This resulted in 1400 outpatient burn clinic follow-up visits. This follow-up

includes patients who were treated as outpatients from the emergency department. During the past fiscal year, patients were admitted from 22 Maryland counties and Baltimore City. In terms of admissions from the Maryland jurisdictions, Baltimore City had the largest percentage of patients admitted (111 patients [34.5 percent]), followed by Baltimore County (60 patients [18.6 percent]). During FY 2002, patients were also admitted from the surrounding area of Delaware, Virginia, West Virginia, Pennsylvania, and Washington, DC. This fiscal year the burn center also received a patient from Africa.

The Burn Center consists of a 10-bed intensive care unit and a 10-bed intermediate care step-down area, which is shared with the Surgical Intensive Care Unit. In addition, five beds are assigned in pediatrics for Burn Center use. The Michael Hendrix Burn Research Center honors Mr. Hendrix who experienced a fatal burn injury while in another state. His family wished to assist in research to aid other burn-injured individuals. Plans are underway to expand outpatient services during FY 2003.

Professional education is provided for hospital-based personnel, such as nurses, doctors, and technicians, as well as for prehospital paramedics and EMTs. Supporting prehospital education, the Burn Center provides academic instruction in burn care, as well as other areas of environmental injury and care. Burn Center staff frequently speak and teach at individual fire companies, and the Burn Center serves as a clinical rotation site for paramedic training programs. The Burn Center is also involved in nursing and physician education programs for nursing, medical, nurse practitioner, physician assistant, and burn technician students.

Community education is still an energizing activity involving many disciplines.

The Baltimore Ravens football team has "adopted" the Baltimore Regional Burn Center. Their involvement focuses on pediatric care, as well as caring for the entire family.

The Baltimore Regional Burn Center Research Laboratory, aided by the Metropolitan Fire

ADMISSIONS TO BALTIMORE REGIONAL BURN CENTER BY MODE OF TRANSPORT (FY 2002)

Mode of Transport	Patients	Percentage
Ambulance	209	64.9
Helicopter	64	19.9
Other	49	15.2

ADMISSIONS TO BALTIMORE REGIONAL BURN CENTER BY TYPE OF BURN (FY 2002)

Type of Burn	Patients	Percentage
Flame	155	48.1
Scald	101	31.4
Electrical	6	5.0
Contact	20	6.2
Chemical	16	5.0
TENS	12	3.7
Sunburn	0	0.0
Frostbite	2	0.6
Radiation	0	0.0

BALTIMORE REGIONAL BURN CENTER STATISTICAL SUMMARY (FY 2002)

Admissions	322
• Adults	232 (72%)
• Children	90 (28%)
Average Age	35.34 years
Average Total Burn Surface Area	11.57
Average Length of Stay	10.32 days
Inhalation Injury	34 (10.6%)
Mortality	19 (5.9%)

Fighters Fund, continues to explore the problems of wound infection, respiratory injury, and cultured patient skin.

The Burn Center at the Washington Hospital Center

The Burn Center at the Washington Hospital Center is located in the District of Columbia and serves as the adult regional burn center for the District, southern Maryland, and northern Virginia. Marion Jordan, MD, is the Director.

The Burn Center features a 7-bed intensive care unit with a dedicated operating room and recovery room, a 13-bed intermediate/rehab care unit, and the Skin Bank for Burn Injuries. Between 275 and 300 adult burn patients are admitted each year.

Reconstructive surgery and rehabilitation are available for patients in the post-acute and convalescent phases, regardless of where they received treatment for their acute burns.

Patients with minor burns that do not require hospitalization are provided with outpatient wound care and rehabilitation through the Burn Center Clinic.

The Curtis National Hand Center At Union Memorial Hospital

The Curtis National Hand Center at Union Memorial Hospital serves as the state's referral center for specialized care of injuries to the hand and upper extremity, including significant elbow trauma and injuries requiring microsurgical reconstruction. Thomas J. Graham, MD, is the Director.

Having received the congressional designation as The National Hand Center in 1994, the Center remains one of the world's premier facilities for the study of hand surgery and the training of orthopaedic, plastic, and general surgeons in the field of upper extremity surgery. Thomas J. Graham, MD is the Director of the Curtis National Hand Center and the Chief of the Union Memorial Hospital Division of Hand Surgery, as well as the Vice-Chairman of Orthopaedics at Union Memorial, and is an Associate Professor of both Orthopaedic and Plastic Surgery at Johns Hopkins University.

The Curtis National Hand Center remains one of the premier U.S. facilities for the care of the hand and upper extremity, committed to handling acute injuries and reconstruction after trauma. The focus on complex hand, wrist, and elbow injuries complements the well-developed Maryland trauma system.

The Center's expertise in complex bone and soft tissue trauma is supplemented by advanced microsurgery skills. The handling of fractures, challenging soft tissue coverage problems, and amputations continues to be the major focus of the Hand Surgery Service at Union Memorial.

The Curtis National Hand Center is one of the largest training centers for hand surgery. The Center's relationships with Johns Hopkins Hospital, Georgetown University, Walter Reed Army Medical Center, and Union Memorial Hospital continue to provide extraordinary training because of the volume and variety of the pathology.

The Hand Center's 11 attending hand surgeons have made numerous presentations and have contributed many publications to hand surgery literature throughout the academic year. In addition, they hosted the 56th Annual Meeting of the American Society for Surgery of the Hand at the Baltimore Convention Center, the first international meeting to return to Baltimore's downtown venue after the September 11th tragedy.

Continuing research projects, funded by both internal and external sources, look at a wide range of pertinent questions, including those in microsurgery, surgery of the peripheral nerve, bone, soft tissue problems, and reconstruction after significant trauma.

The Hand Center is working toward developing an international training center for orthopaedic surgery. This facility for the training of surgeons in the specialty of hand surgery possibly would be associated with the Orthopaedic Learning Center in Rosemont, Illinois. This is a significant project for the entire city of Baltimore that will define it as one of the leading training centers for continuing medical education for surgeons in training and in practice.

Among other upcoming projects is the physical reorganization of the trauma intake facility to introduce even better processes for the traumatically injured patient. The concentration on musculoskeletal services is led by the group in hand surgery.

Hyperbaric Medicine Center R Adams Cowley Shock Trauma Center

The Hyperbaric Medicine Center of the R Adams Cowley Shock Trauma Center of the University of Maryland Medical Systems is the statewide referral center for victims of diving accidents, carbon monoxide poisoning, smoke inhalation, and gas gangrene. It is the only multiplace chamber in Maryland, and is capable of accommodating 10 stretcher patients or 23 seated patients simultaneously. The center is able to provide treatment around the clock, 365 days a year. Robert Rosenthal, MD, is the Director of the Hyperbaric Medicine Center.

During FY 2002, the types of emergent cases treated included: carbon monoxide poisoning/smoke inhalation; arterial gas embolism; decompression sickness (the bends), clostridial myonecrosis; group A beta hemolytic strep fasciitis/myositis; necrotizing fasciitis; compromised skin grafts and flaps; crush injuries; and exceptional blood loss anemia.

The types of non-emergent cases treated included: non-healing diabetic extremity wounds; refractory osteomyelitis; osteoradionecrosis; and radiation cystitis/enteritis.

All treatments are supervised by specially trained hyperbaric physicians; direct patient contact is administered by critical care nurse "tenders"

who provide patient care in the chamber during all "dives." Because of the chamber's unique design and staffing, even the most critically ill patients can receive hyperbaric treatments without any interruption of care.

Physician and nursing members of the Hyperbaric Medicine Center actively lecture on hyperbaric medical education at regional and national levels and to local and regional EMS providers.

Researchers from the Department of Hyperbaric Medicine, in collaboration with the Department of Anesthesiology, are actively continuing pre-clinical investigations exploring the neuroprotective effects of hyperbaric oxygen following cardiac arrest and brain injury. Additionally, departmental researchers, in collaboration with the Division of Plastic Surgery, are exploring the ability of hyperbaric oxygen to promote the "acceptance" of tissue flaps following surgery or trauma.

Maryland Eye Trauma System The Wilmer Eye Institute at Johns Hopkins

The Eye Trauma Center at the Wilmer Eye Institute, at the Johns Hopkins Hospital is the first statewide eye trauma center in the nation. The main objectives of the eye trauma center are to provide optimal clinical management of severe ocular injuries, to conduct research into the natural history of eye trauma, to develop new treatments for ocular trauma, and to initiate and support eye trauma prevention activities. Joseph B. Harlan, MD, is the Director of the Center; the Associate Director for FY 2003 is James Lai, MD.

In FY 2002, the Wilmer Eye Institute (WEI) Emergency Room reported 6,494 patient visits. Of these, 34% (2,207 patients) had eye injuries and trauma, 5% of which were admitted to the inpatient unit. The demographic representation is as follows: 58% male, 42% female; 52% Caucasian, 42% African American, 1% Asian Pacific, and 5% others/unknown.

A grant to study more sensitive methods of detecting retinal pathology in shaken baby syndrome was approved this year. The WEI continues to enroll patients in two important eye trauma research studies:

- Investigation of Prophylactic Intravitreal Antibiotics in Open Globe Injuries
- Multi-Center Trial on Prophylactic Scleral

Buckling in Posterior Segment Injuries

The WEI participated in the 2000 National Hospital Ambulatory Medical Care Survey (NHAMCS) on visits to hospital emergency and outpatient departments of non-federal, short-stay, and general hospitals in the United States. This survey reported trends in the emergency department utilization from 1997 through 2000. The Division of Health Care Statistics of the National Center conducted this survey for Health Statistics, Centers for Disease Control and Prevention.

Dr. Joseph B. Harlan and Dr. Dante Pieramici, former Director of Ocular Trauma, WEI, co-authored an article entitled, "Evaluation of Patients with Ocular Trauma" (published by the *Ophthalmology Clinics of North America*, 2002). Dr. Harlan gave a presentation on ocular trauma during the conference for prehospital providers, EMS Care 2002. He also conducted educational grand rounds presentations on eye trauma prevention and management to Hopkins' adult and pediatric emergency room nurses and physicians.

The faculty and nursing staff of the WEI are active participants in the Johns Hopkins Hospital planning committee on chemical and bioterrorism preparedness and have provided educational programs on ocular complications of smallpox, botulinum, and mustard gas.

The 19th Annual Wilmer Nursing Conference in May 2002 included presentations on "Potential Ocular Consequences of Biological and Chemical Agents" by Dr. Neil R. Miller and "Orbital and Lid Trauma: When the Fist Meets the Eye" by Dr. Shannath Merbs. In addition, the keynote address entitled, "Under Siege: One State's Perspective of the Anthrax Events" was presented by Dr. Julie Ann Casani, Bioterrorism Coordinator, Maryland Department of Health and Mental Hygiene.

The WEI provides data on severe eye trauma cases to the United States Eye Injury Registry in Alabama.

Maryland Eye Trauma System Suburban Hospital Eye Trauma Center

Suburban Hospital has served as a state-designated Eye Trauma Center since July 2001 with a dedicated, fully equipped eye trauma room for the evaluation and treatment of eye trauma patients. Leonard Parver, MD, serves as the Medical Director and Anne Kuzas, RN, as its Trauma Nurse Coordinator. Dr. Benjamin Rubin, who is affiliated with the National Eye Institute, serves as the Clinical Director of the Eye Trauma Research Program.

The Suburban Hospital Eye Trauma Center treated 65 eye trauma patients during FY 2002. Of these 65 cases, 85% were due to blunt injuries, 12% were due to penetrating injuries, and 3% were due to other causes such as chemical exposures. Of the patients treated, 77% were transported from the scene, 15% were interhospital transfers, and 5% arrived at the center by other means. Twenty-six percent (26%) of these patients required immediate surgical management of their injury.

Leonard Parver, MD, the Medical Director of the Eye Trauma Center, co-authored an article, "Bioterror: What Ophthalmologists Need to Know," which was published in the *Review of Ophthalmology* in January 2002. Several research projects were initiated during the fiscal year, some of which are expected to be published within the upcoming fiscal year, including traumatic hyphemas and Sympathetic Ophthalmia in Civilian Eye Injuries.

The Eye Trauma Center established an affiliation with the Walter Reed Army Medical Center Ophthalmology Department, and third-year residents from this program participate in the Eye Trauma Program. An Ophthalmology Journal Club has also been established in collaboration with the Ophthalmology Program at Walter Reed.

The Eye Trauma Center has expanded its community outreach program. Eye Trauma Center staff participate in multiple educational and community outreach activities through school events, after-school programs, health fairs, seminars, and work sites. Prevention measures, eye safety, and visual assessment are program components.

Eye Trauma Patient Statistics

AGE	FY 01(%)	FY 02(%)
≤12 years	2	2
13–18 years	12	11
19–30 years	19	17
31–50 years	34	45
51–65 years	19	2
≥65 years	15	25
GENDER	FY 01	FY 02
Male	61%	71%
Female	39%	29%

Neurotrauma Center R Adams Cowley Shock Trauma Center

The Neurotrauma Center at the R Adams Cowley Shock Trauma Center, University of Maryland Medical System, provides comprehensive management for patients with brain, spinal cord, and spinal-column-related injuries. Bizhan Aarabi, MD, is the Director of the Neurotrauma Center.

More than 500 neurosurgical procedures were performed for a variety of acute complex head and spinal cord injuries. Patients with epidural hematomas, intracerebral hematomas, subdural hematomas, and subarachnoid hemorrhages received care based on the latest treatment protocols. The Neurotrauma Center also provided state-of-the-art care for patients with complex spinal column injuries.

Pediatric Trauma Center at the Johns Hopkins Children's Center

In FY 2002, 806 children (ages newborn to 14 years) were treated at the Pediatric Trauma Center at the Johns Hopkins Children's Center, located in Baltimore City. Charles N. Paidas, MD, is the Director, and Susan Ziegfeld, MSN, CCRN, CPNP, serves as the Trauma Nurse Coordinator.

The Pediatric Trauma Service (PTS) at the Johns Hopkins Children Center is the level one pediatric trauma facility for the state of Maryland. The PTS is an advocate in the care of critically ill and injured children and is actively involved in the prevention of pediatric injuries at the local, state, and national levels. The PTS integrates patient care with ongoing National Institutes of Health (NIH)-funded laboratory and clinical research and collaborates with other departments and the community to provide childhood injury prevention activities. Charles N. Paidas, MD, Director of the Pediatric Trauma Center, serves as the American College of Surgeons State Chair for the Committee on Trauma. In addition, he is a voting member of the Maryland Pediatric Emergency Medical Advisory Group (PEMAG). Moreover, Dr. Paidas is co-chairman of the Pediatric Advanced Life Support Course (PALS) and has brought this course to Greece to assist in training physicians and health care providers abroad.

Susan Ziegfeld, MSN, CCRN, CPNP, Trauma Nurse Coordinator, serves on the Maryland Trauma and Specialty Care Quality Improvement

Committee and on the Maryland Trauma Registry, Education and Injury Prevention Committee. She is collaborating with the Air Force and R Adams Cowley Shock Trauma Center to bring the Advanced Trauma Care for Nurses course to Maryland. Dr. Paidas and Susan Ziegfeld actively participate in prehospital provider follow-up and education.

Vinita Misra, MPH, Pediatric Trauma Program Coordinator, serves on the Maryland Trauma and Specialty Care Quality Improvement Committee, the Maryland Trauma Registry, Education and Injury Prevention Committee, and the Pediatric Quality Improvement Committee of the Maryland EMS Quality Leadership Council. Mary Pasquariello, Pediatric Trauma Registrar, oversees all aspects of data collection and management. Both Ms. Misra and Ms. Pasquariello are certified as car safety seat technicians.

Elizabeth Berg, RN, BSN, Nursing Outreach Coordinator for the Hopkins Outreach for Pediatric Education (HOPE), has served in numerous capacities throughout the EMS system to enhance the care of critically ill and injured children. HOPE has continued to provide quality educational programs for all prehospital providers. More than 340 participants have completed the PALS course during the past year.

Dr. Paidas has received basic science research funding for heat shock studies in the genetics of response to injury, as well as for studies analyzing



the role of heat shock proteins in inflammation and injury. Dr. Paidas also serves as the Co-Principal Investigator for a multi-center, Centers

CNMC PEDIATRIC TRAUMA CENTER STATISTICAL SUMMARY (FY 2002)

Total Maryland Admissions: 903

Maryland Patients Transferred from Other Hospitals: 306

Age (Years)	<1	85
	1-4	278
	5-9	232
	10-14	252
	≥15	54
	Not Valued	2
Sex	Male	558
	Female	345
County of Residence	Anne Arundel	27
	Baltimore	1
	Calvert	28
	Carroll	3
	Charles	69
	Dorchester	1
	Frederick	11
	Howard	8
	Montgomery	242
	Prince George's	423
	St. Mary's	42
	Washington	3
	Wocomico	1
	Baltimore City	3
	Virginia	8
	W. Virginia	1
	Washington, D.C.	21
	Other	11
Type of Injury	Blunt	627
	Penetrating	13
	Burn	96*
	Near Drowning	15
	Hanging	1
	Inhalation	8
	Ingestion	119
	Crush	1
	Snake/Spider Bite	3
	Animal/Human Bite	13
	Other	2
	Not Valued	5
Etiology	Motor Vehicle Accident	156
	Motorcycle Accident	11
	Pedestrian Struck	54
	Gunshot Wounds	10
	Stabbing	8
	Falls	257
	Burns	91
	Other Assault	7
	Drowning	14
	Other	286
	Not Valued	9
Transport from Scene	Ground	191
	Air	249
	Private	301
	Other or Not Valued	162**

* The discrepancy between the number of burns between 'type of injury' and 'etiology' is possibly due to a non-specific e-code for five of the burns.

** Please note that many of the patients categorized as "unknown" or "not recorded" were treated at other hospitals prior to being transported to CNMC, and CNMC is missing some other original scene run sheets.

for Disease Control-funded study that measures the quality-of-life outcomes of children who have sustained traumatic brain injuries via the recently developed Pediatric Quality of Life Inventory instrument.

The Pediatric Trauma Center, collaborating with the Children's Safety Center and the Bloomberg Center for Injury Research and Policy, was awarded a grant from the Injury Free Coalition for Kids sponsored by the Robert Wood Johnson Foundation. The Injury Free Coalition for Kids of Baltimore will work with inner-city communities to help reduce preventable injuries to children, focusing on the areas in East Baltimore that have the highest injury rate. The Coalition will also provide training programs for parents and other caregivers that will teach them about causes of injury in their neighborhoods, effective solutions for preventing injury, and strategies for advocating for safety improvements.

Pediatric Trauma Center Children's National Medical Center

In FY 2002, 903 children (ages newborn to 14 years, who resided and/or were injured in Maryland) were treated at the Pediatric Trauma Center at the Children's National Medical Center. Martin R. Eichelberger, MD, is the Director of Emergency Trauma-Burn Services.

The Children's National Medical Center (CNMC) was re-verified by the American College of Surgeons in June 2000 as a Level I Pediatric Trauma Center. CNMC serves the pediatric community of Region V, which includes Montgomery, Prince George's, Calvert, Charles, and St. Mary's counties.

CNMC provides pediatric emergency and trauma education to physicians, nurses, and pre-hospital providers. The EMT-B course is offered twice a year. Ten courses in Pediatric Advanced Life Support (PALS) are offered annually. The Pediatric Education for Prehospital Providers (PEPP) was added to the educational offerings, in addition to other continuing education programs.

The National SAFE KIDS Campaign highlighted prevention of traumatic brain injury through the use of helmets as the primary focus for the year 2002. The campaign interacts with more than 300 state and local SAFE KIDS coalitions in 52 states and jurisdictions and 14 foreign countries.



CNMC houses the Emergency Medical Services for Children (EMSC) National Resource Center and supports programs that enhance the quality of medical and trauma care those children receive. Since 1984, 55 states and jurisdictions have received grants. One-hundred targeted issue grants and several research studies have also been funded.

CNMC is part of the Crash Injury Research and Engineering Network (CIREN), funded by the U.S. Department of Transportation. It is the only pediatric center of the seven centers that are investigating the bio-mechanics of vehicle crashes and the anatomic and physiologic impact on children.

Perinatal Referral Centers

This year MIEMSS continued the designation process for the perinatal referral centers. On-site reviews of the six Level III+ applicants were conducted, and all received full designation as Level III+ Perinatal Referral Centers. The rest of the Level III+ applicants will be reviewed during FY 2003.

MIEMSS has worked closely with the Department of Health and Mental Hygiene (DHMH) regarding perinatal centers in Maryland. DHMH provides grant funds to support a fulltime staff member to coordinate the perinatal programs at MIEMSS.

Poison Consultation Center Maryland Poison Center

The Maryland Poison Center (MPC) is a certified regional poison center that provides emergency telephone poison information 24 hours a day to the general public and health professionals in the state. A division of the University of Maryland School of Pharmacy, MPC is designated by the Maryland Department of Health and Mental Hygiene as the state's regional poison center. MPC also serves as a consultation center for MIEMSS. Bruce D. Anderson, PharmD, ABAT, is Director of Operations, and Suzanne Doyon, MD, ACMT, is Medical Director.

In Calendar Year 2001, the Maryland Poison Center received 57,130 calls. While 35,238 of these calls involved a human exposure, the remaining 21,847 were animal exposures or requests for information where no exposure occurred. The majority of poison exposures (54.5%) involved children under the age of six. Although the incidence of poisoning is greater in children, most severe poisonings and poisoning deaths occur in adolescents and adults.

Seventy-five percent of the cases reported to the Maryland Poison Center were managed at a non-health care facility site, such as the home, school, or workplace. Safely managing these patients at the site of the exposure saves millions of dollars in unnecessary health care costs. It also allows more efficient and effective use of limited health care resources.

All of the poison specialists who work in the Maryland Poison Center are pharmacists and nurses certified as specialists in poison information by the American Association of Poison Control Centers. Managing at least 2,000 human-exposure-poisoning cases and passing a national certification examination are required to become a certified specialist. Specialists must re-test every seven years to maintain their status.

The Maryland Poison Center continues to provide educational programs and materials to the public and health professionals. Programs for schools, parent groups, workplaces, and other community organizations were conducted throughout Maryland in 2001. Paramedics, nurses, physicians, and pharmacists attended over 60 professional education programs. The MPC serves as a training site for a variety of health professionals.

The Poison Control Center Enhancement and Awareness Act was signed into federal law in February 2000 to help stabilize the funding of poison centers and to assist in poison prevention education. This law also mandated the establishment of a nationwide toll-free phone number 1-800-222-1222 that will automatically direct callers to their regional poison center no matter where they are in the U.S. The Maryland Poison Center implemented this national telephone number in June 2001. During the past year, education and outreach remained a strong focus for the Maryland Poison Center. It received a federal grant award of \$179,150 to help support education and outreach for the Maryland Poison Center. In addition, Angela Bivens joined the education team for the Maryland Poison Center as a full-time public health educator. She had previously served as a

certified specialist in poison information at the Maryland Poison Center for seven years. The Maryland Poison Center also contracted with a local advertising and public relations firm, MGH, to assist with outreach and awareness.

In addition, the Maryland Poison Center implemented a new data collection system. With the new system, the Maryland Poison Center can submit data in near real time to a nationwide poison center surveillance system. The goal is to assist with nationwide monitoring for possible biologic or chemical weapons exposures or other toxic outbreaks.

Cause of Poisoning (CY 2001)

Circumstance	Number of Patients	Percentage
Unintentional	29,092	82.45
Intentional	5,220	14.80
Other & Unknown	212	0.60
Adverse Reaction	714	2.02
TOTAL	35,238	100.00

Medical Outcome (CY 2001)

Medical Outcome	Number of Patients	Percentage
No Effect/Minor Effect	32,608	92.70
Moderate Effect	1,240	3.52
Major Effect	115	0.33
Death	24	0.07
Unknown/Unrelated Effect	1,251	3.55
TOTAL	35,238	100.00

NOTE: The medical outcome is assessed, based on the inherent toxicity of the agent and the severity of the clinical manifestations.

Location of Exposure by Region (CY 2001)

Region	Number of Exposures	Percentage
Region I (Garrett, Allegany)	698	1.98
Region II (Washington, Frederick)	2,432	6.90
Region III (Carroll, Howard, Harford, Anne Arundel, Baltimore County, Baltimore City)	21,681	61.45
Region IV (Cecil, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Worcester)	3,147	8.92
Region V (Montgomery, Prince George's Charles, Calvert, St. Mary's)	6,448	18.28
Unknown	832	2.36
TOTAL	35,238	100.0

DESTINATIONS OF TRAUMA PATIENTS WHO WENT TO INPATIENT REHABILITATION FACILITIES:

(JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Facility	Number of patients
Bryn Mawr Rehabilitation Hospital at Maryland General Hospital	28
Deaton Hospital and Medical Center of Christ Lutheran Church	40
Genesis Long-Term Care Facilities	35
Good Samaritan Hospital of Maryland	19
Health South Chesapeake Rehabilitation Center, Salisbury, Maryland	23
Johns Hopkins Comprehensive Geriatric Center	27
Kernan Hospital	412
NRH Regional Rehabilitation @ Irving Street, DC	26
Sinai Rehabilitation Center	23
Washington County Health System, Comprehensive Inpatient Rehab Services	29

REHABILITATION

The vision of MIEMSS is the elimination of preventable deaths and disabilities due to sudden illness or injury through an integrated system of prevention, intervention, and rehabilitation. This integrated system is known as the trauma care continuum. Rehabilitation is the cornerstone of "post-trauma" care. It is the phase of emergency care that enables the individual to return to a maximum level of function and, in most cases, to return as a productive member of society.

In Maryland we are fortunate to have an extensive number of rehabilitation providers to treat patients who have experienced neurotrauma, multitrauma, and orthopedic injuries in various treatment settings. The trauma centers provide transitional (subacute) care or have transfer agreements with rehabilitation hospitals to provide this specialized care. Rehabilitation services are provided in hospitals, acute inpatient rehabilitation hospitals, long-term care facilities, home care, outpatient services, and community-based rehabilitation programs. During FY 2002, trauma centers in Maryland referred 1,098 trauma patients over the age of 15 to inpatient rehabilitation services. The ten rehabilitation facilities receiving the most patients are listed on this page.

MARYLAND ADULT TRAUMA STATISTICS

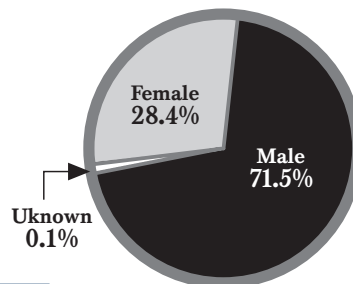
LEGEND CODE

The Johns Hopkins Bayview Medical Center	BVMC
Johns Hopkins Medical System	JHH
Peninsula Regional Medical Center	PEN
Prince George's Hospital Center	PGH
R Adams Cowley Shock Trauma Center	STC
Sinai Hospital of Baltimore	SH
Suburban Hospital	SUB
Washington County Hospital Association	WCH
Western Maryland Health System- Cumberland Memorial Trauma Center	WMHS

GENDER OF PATIENTS: PRIMARY ADMISSIONS ONLY

(June 2001 to May 2002)

Source: Maryland Adult Trauma Registry



Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

TOTAL CASES REPORTED BY TRAUMA CENTERS (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Trauma Center	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
The Johns Hopkins Bayview Medical Center	1,535	1,385	1,318
Johns Hopkins Medical System	2,345	1,978	1,975
Peninsula Regional Medical Center	721	794	851
Prince George's Hospital Center	2,053	2,000	2,467
R Adams Cowley Shock Trauma Center	5,657	5,795	6,094
Sinai Hospital of Baltimore	963	776	771
Suburban Hospital	987	1,070	1,252
Washington County Hospital Association	659	745	698
Western Maryland Health System- Cumberland Memorial Trauma Center	603	525	483
TOTAL	15,523	15,068	15,909



**OCCURRENCE OF INJURY BY COUNTY:
SCENE ORIGIN CASES ONLY
(JUNE 2001 TO MAY 2002)**

Source: Maryland Adult Trauma Registry

County of Injury	Number
Allegany County	193
Anne Arundel County	917
Baltimore County	1,562
Calvert County	99
Caroline County	69
Carroll County	331
Cecil County	207
Charles County	194
Dorchester County	69
Frederick County	289
Garrett County	33
Harford County	436
Howard County	437
Kent County	65
Montgomery County	1,216
Prince George's County	1,583
Queen Anne's County	90
St. Mary's County	94
Somerset County	63
Talbot County	88
Washington County	393
Wicomico County	254
Worcester County	193
Baltimore City	3,951
Virginia	70
West Virginia	194
Pennsylvania	56
Washington, DC	144
Delaware	84
Not Indicated	684
TOTAL	14,058

Note: Scene origin cases represent 88.4% of the total trauma cases treated statewide.

**RESIDENCE OF PATIENTS BY COUNTY:
SCENE ORIGIN CASES ONLY
(JUNE 2001 TO MAY 2002)**

Source: Maryland Adult Trauma Registry

County of Residence	Number
Allegany County	190
Anne Arundel County	962
Baltimore County	1,799
Calvert County	126
Caroline County	92
Carroll County	341
Cecil County	144
Charles County	193
Dorchester County	67
Frederick County	242
Garrett County	30
Harford County	443
Howard County	301
Kent County	57
Montgomery County	1,105
Prince George's County	1,401
Queen Anne's County	80
St. Mary's County	107
Somerset County	69
Talbot County	57
Washington County	324
Wicomico County	239
Worcester County	152
Baltimore City	3,820
Virginia	320
West Virginia	217
Pennsylvania	300
Washington, DC	295
Delaware	160
Other	305
Not Indicated	120
TOTAL	14,058

Note: Scene origin cases represent 88.4% of the total trauma cases treated statewide.

**PATIENTS WITH PROTECTIVE DEVICES AT TIME
OF TRAUMA INCIDENT:
PRIMARY ADMISSIONS ONLY
(3 YEAR COMPARISON)**

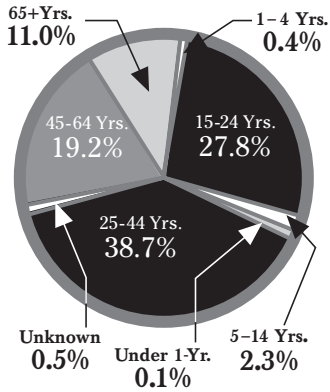
Source: Maryland Adult Trauma Registry

Protective Device	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
None	36.6%	32.0%	33.9%
Seatbelt	43.7%	44.3%	40.8%
Airbag & Seatbelt	9.7%	11.9%	12.4%
Airbag Only	2.5%	3.2%	3.2%
Infant/Child Seat	0.1%	0.2%	0.2%
Protective Helmet	7.1%	8.2%	9.0%
Padding/Protective Clothing	0.1%	0.0%	0.1%
Other Protective Device	0.2%	0.2%	0.4%
TOTAL	100.0%	100.0%	100.0%

Note: Patients were involved in motor vehicle, motorcycle, bicycle, and sports-related incidents only. "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

AGE DISTRIBUTION OF PATIENTS: PRIMARY ADMISSIONS ONLY (June 2001 to May 2002)

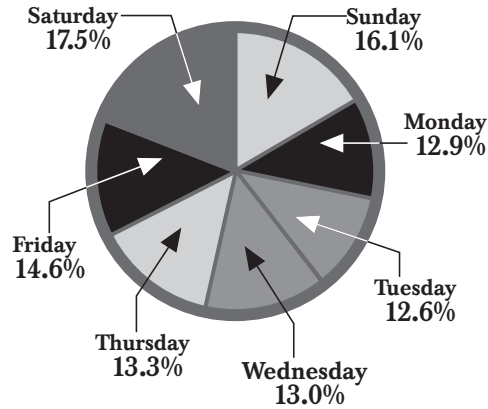
Source: Maryland Adult Trauma Registry



Notes: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival. Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

EMERGENCY DEPARTMENT ARRIVALS BY DAY OF WEEK: PRIMARY ADMISSIONS ONLY (June 2001 to May 2002)

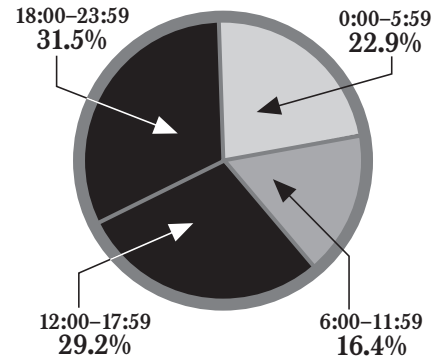
Source: Maryland Adult Trauma Registry



Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

EMERGENCY DEPARTMENT ARRIVALS BY TIME OF DAY: PRIMARY ADMISSIONS ONLY (June 2001 to May 2002)

Source: Maryland Adult Trauma Registry



Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

MODE OF PATIENT TRANSPORT TO TRAUMA CENTERS (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Modality Type	BVMC	JHH	PEN	PGH	SH	STC	SUB	WCH	WMHS	TOTAL
Ground Ambulance	78.5%	83.0%	60.5%	60.0%	90.3%	56.3%	79.4%	68.9%	55.9%	66.4%
Helicopter	0.1%	1.6%	28.3%	34.1%	0.1%	42.1%	17.9%	23.2%	32.3%	26.4%
Other	21.4%	15.4%	11.2%	5.9%	9.6%	1.6%	2.7%	7.9%	11.8%	7.2%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

ORIGIN OF PATIENT TRANSPORT TO TRAUMA CENTERS (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Origin Type	BVMC	JHH	PEN	PGH	SH	STC	SUB	WCH	WMHS	TOTAL
Scene of Injury	94.1%	83.6%	97.2%	97.6%	97.6%	84.7%	94.1%	90.9%	88.6%	89.6%
Hospital Transfer	0.2%	1.8%	2.8%	1.2%	0.4%	15.3%	4.5%	5.6%	11.0%	7.5%
Other	5.7%	14.6%	0.0%	1.2%	2.0%	0.0%	1.4%	3.5%	0.4%	2.9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NUMBER OF DEATHS BY AGE (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Age	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Under 1 year	1	0	2
1 to 4 years	0	4	4
5 to 14 years	12	12	8
15 to 24 years	182	149	153
25 to 44 years	194	175	188
45 to 64 years	99	96	102
65+ years	140	161	155
Unknown	13	13	16
TOTAL	641	610	628

Deaths Overall as a
Percentage of the Total
Injuries Treated

4.1% 4.0% 3.9%

Note: Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

NUMBER OF INJURIES BY AGE (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Age	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Under 1 year	28	37	24
1 to 4 years	104	108	88
5 to 14 years	488	405	405
15 to 24 years	4,440	4,290	4,642
25 to 44 years	6,394	5,991	6,235
45 to 64 years	2,600	2,719	2,935
65+ years	1,442	1,496	1,519
Unknown	27	22	61
TOTAL	15,523	15,068	15,909

Note: Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

NUMBER OF INJURIES AND DEATHS BY AGE (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	24	23	2	1
1 to 4 years	88	75	4	3
5 to 14 years	405	340	8	8
15 to 24 years	4,642	4,065	153	126
25 to 44 years	6,235	5,424	188	148
45 to 64 years	2,935	2,519	102	87
65+ years	1,519	1,358	155	132
Unknown	61	29	16	13
TOTAL	15,909	13,833	628	518

Note: Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric centers, see pediatric trauma center tables and graphs.

ETIOLOGY OF INJURIES TO PATIENTS: PRIMARY ADMISSIONS ONLY (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Etiology	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Motor Vehicle Crash	39.9%	41.8%	41.9%
Motorcycle Crash	3.4%	4.0%	4.6%
Pedestrian Incident	6.0%	5.9%	6.0%
Fall	16.9%	17.3%	17.7%
Gunshot Wound	9.9%	7.7%	7.7%
Stab Wound	6.6%	6.6%	7.3%
Other	17.3%	16.7%	14.8%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

BLOOD ALCOHOL CONTENT OF PATIENTS BY INJURY TYPE: PRIMARY ADMISSIONS ONLY (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Blood Alcohol Content	Motor Vehicle				Total
	Crash	Assault	Fall	Other	
Negative	57.6%	40.9%	47.9%	47.6%	51.5%
Positive	22.9%	36.2%	17.0%	12.6%	23.8%
Undetermined	19.5%	22.9%	35.1%	39.8%	24.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

ETIOLOGY OF INJURIES BY AGES OF PATIENTS: PRIMARY ADMISSIONS ONLY (JUNE 2001 TO MAY 2002)

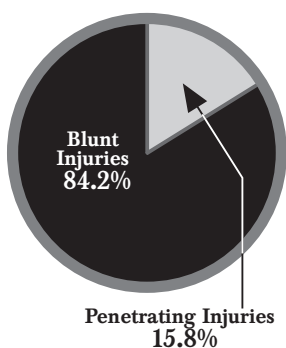
Source: Maryland Adult Trauma Registry

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound	Other	Total
Under 1 year	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.2%	0.1%
1 to 4 years	0.3%	0.0%	0.6%	1.0%	0.0%	0.0%	0.7%	0.4%
5 to 14 years	2.1%	1.8%	6.6%	1.8%	1.3%	0.7%	3.2%	2.3%
15 to 24 years	32.4%	24.1%	19.8%	11.3%	50.1%	36.9%	23.0%	27.8%
25 to 44 years	35.9%	54.4%	39.3%	28.5%	40.3%	50.7%	46.7%	38.7%
45 to 64 years	19.4%	18.6%	23.4%	25.2%	5.3%	10.6%	21.2%	19.2%
65+ years	9.6%	1.1%	9.7%	31.6%	1.5%	0.9%	4.5%	11.0%
Unknown	0.3%	0.0%	0.6%	0.2%	1.4%	0.2%	0.5%	0.5%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival. Only pediatric patients that were treated at adult trauma centers are included in this table. For patients treated at the pediatric trauma centers, see pediatric trauma center tables and graphs.

INJURY TYPE DISTRIBUTION OF PATIENTS: PRIMARY ADMISSIONS ONLY (June 2001 to May 2002)

Source: Maryland Adult Trauma Registry



Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

ETIOLOGY DISTRIBUTION FOR PATIENTS WITH BLUNT INJURIES: PRIMARY ADMISSIONS ONLY (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Etiology	Percentage
Motor Vehicle Crash	50.1%
Motorcycle Crash	5.5%
Pedestrian Incident	7.2%
Fall	21.0%
Other	15.6%
Unknown	0.6%
TOTAL	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

ETIOLOGY DISTRIBUTION FOR PATIENTS WITH PENETRATING INJURIES: PRIMARY ADMISSIONS ONLY (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

Etiology	Percentage
Motor Vehicle Crash	0.5%
Motorcycle Crash	0.1%
Pedestrian Incident	0.1%
Gunshot Wound	48.7%
Stabbing	46.0%
Fall	0.6%
Other	3.8%
Unknown	0.2%
TOTAL	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

FINAL DISPOSITION OF PATIENTS: PRIMARY ADMISSIONS ONLY (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

Final Disposition	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Inpatient Rehab Facility	8.5%	9.6%	9.2%
Skilled Nursing Facility	2.0%	2.0%	1.9%
Residential Facility	0.8%	1.0%	1.2%
Specialty Referral Center	2.5%	2.5%	2.8%
Home with Services	6.3%	5.6%	4.2%
Home	69.2%	69.3%	70.9%
Acute Care Hospital	2.5%	2.5%	2.4%
Against Medical Advice	1.9%	1.8%	1.7%
Morgue/Died	5.6%	5.4%	5.2%
Left without Treatment	0.1%	0.0%	0.0%
Other	0.6%	0.3%	0.5%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

INJURY SEVERITY SCORES OF PATIENTS WITH PENETRATING INJURIES: PRIMARY ADMISSIONS ONLY (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

ISS	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
1 to 12	70.9%	74.1%	74.7%
13 to 19	12.2%	11.1%	10.2%
20 to 35	11.9%	11.9%	10.9%
36 to 75	5.0%	2.9%	4.2%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

INJURY SEVERITY SCORE (ISS) BY INJURY TYPE: PRIMARY ADMISSIONS ONLY (JUNE 2001 TO MAY 2002)

Source: Maryland Adult Trauma Registry

ISS	Blunt	Penetrating	Total
1 to 12	69.8%	74.7%	70.6%
13 to 19	15.9%	10.2%	15.0%
20 to 35	11.9%	10.9%	11.7%
36 to 75	2.4%	4.2%	2.7%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

INJURY SEVERITY SCORES OF PATIENTS WITH BLUNT INJURIES: PRIMARY ADMISSIONS ONLY (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

ISS	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
1 to 12	72.3%	71.3%	69.8%
13 to 19	14.6%	15.7%	15.9%
20 to 35	10.5%	10.4%	11.9%
36 to 75	2.6%	2.6%	2.4%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

INJURY SEVERITY SCORES OF PATIENTS WITH EITHER BLUNT OR PENETRATING INJURIES: PRIMARY ADMISSIONS ONLY (3 YEAR COMPARISON)

Source: Maryland Adult Trauma Registry

ISS	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
1 to 12	72.1%	71.8%	70.6%
13 to 19	14.1%	15.0%	15.0%
20 to 35	10.8%	10.6%	11.7%
36 to 75	3.0%	2.6%	2.7%
TOTAL	100.0%	100.0%	100.0%

Note: "Primary Admissions" refer to all patients except those treated and released from the emergency department within 6 hours of emergency department arrival.

MARYLAND PEDIATRIC TRAUMA STATISTICS

LEGEND CODE

Children's National Medical Center
Johns Hopkins Pediatric Trauma Center

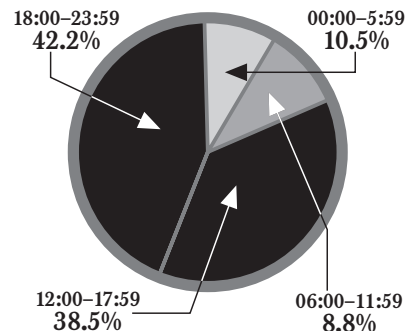
CNMC
JHP

TOTAL CASES REPORTED BY TRAUMA CENTERS PATIENTS TREATED AT PEDIATRIC TRAUMA CENTERS (3 YEAR COMPARISON)

Trauma Center	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
CMNC	656	833	866
JHP	897	769	806
TOTAL	1,553	1,602	1,672

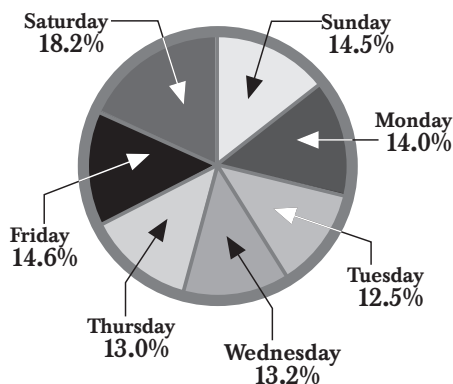
Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

EMERGENCY DEPARTMENT ARRIVALS BY TIME OF DAY: PATIENTS TREATED AT PEDIATRIC TRAUMA CENTERS (June 2001 to May 2002)



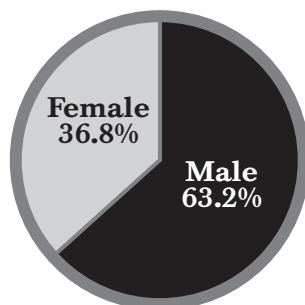
Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

EMERGENCY DEPARTMENT ARRIVALS BY DAY OF WEEK: PATIENTS TREATED AT PEDIATRIC TRAUMA CENTERS (June 2001 to May 2002)



Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

GENDER PROFILE: PATIENTS TREATED AT PEDIATRIC TRAUMA CENTERS (June 2001 to May 2002)



Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

OCCURRENCE OF INJURY BY COUNTY: SCENE ORIGIN CASES ONLY

*Patients Treated at Pediatric Trauma
Centers (June 2001 to May 2002)*

County of Injury	Number
Anne Arundel County	68
Baltimore County	119
Calvert County	12
Caroline County	2
Carroll County	24
Cecil County	24
Charles County	39
Dorchester County	3
Frederick County	20
Harford County	45
Howard County	20
Kent County	2
Montgomery County	128
Prince George's County	246
Queen Anne's County	10
St. Mary's County	27
Talbot County	7
Washington County	1
Baltimore City	189
Virginia	1
Washington, DC	23
Not Indicated	150
TOTAL	1,160

Notes: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland. Scene origin cases represent 69.4% of the total cases treated at pediatric trauma centers.

MODE OF PATIENT TRANSPORT BY CENTER

Patients Treated at Pediatric Trauma Centers (June 2001 to May 2002)

Modality Type	CNMC	JHP	Total
Ground Ambulance	26.3%	53.9%	40.1%
Helicopter	31.0%	35.4%	33.2%
Other	42.7%	10.7%	26.7%
TOTAL	100.0%	100.0%	100.0%

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

ORIGIN OF PATIENT TRANSPORT BY CENTER

Patients Treated at Pediatric Trauma Centers (June 2001 to May 2002)

Origin	CNMC	JHP	Total
Scene of Injury	62.3%	77.0%	69.4%
Hospital Transfer	34.4%	19.4%	27.1%
Other	3.3%	3.6%	3.5%
TOTAL	100.0%	100.0%	100.0%

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

OUTCOME PROFILE: PATIENTS TREATED AT PEDIATRIC TRAUMA CENTERS (June 2001 to May 2002)



Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

FINAL DISPOSITION OF PATIENTS:

Patients Treated at Pediatric Trauma Centers (3 Year Comparison)

Final Disposition	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Inpatient Rehab Facility	1.9%	2.3%	1.5%
Skilled Nursing Facility	0.1%	0.1%	0.0%
Residential Facility	0.1%	0.1%	0.1%
Specialty Referral Center	0.5%	0.3%	0.6%
Home with Services	1.7%	2.3%	2.2%
Home	93.2%	92.3%	92.8%
Acute Care Hospital	0.5%	0.2%	0.4%
Against Medical Advice	0.0%	0.2%	0.1%
Morgue/Died	1.7%	1.9%	2.0%
Foster Care	0.0%	0.1%	0.2%
Other	0.3%	0.2%	0.1%
TOTAL	100.0%	100.0%	100.0%

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

ETIOLOGY OF INJURIES BY AGES

Patients Treated at Pediatric Trauma Centers (June 2001 to May 2002)

Age	Motor Vehicle Crash	Motorcycle	Pedestrian	Fall	Gunshot Wound	Stab Wound*	Other	Total
Under 1 year	6.1%	0.0%	0.6%	14.1%	0.0%	0.0%	9.8%	8.8%
1 to 4 years	20.7%	0.0%	16.7%	32.2%	13.1%	24.0%	31.9%	27.1%
5 to 9 years	27.4%	31.8%	50.5%	26.9%	8.7%	24.0%	19.7%	26.9%
10 to 14 years	43.9%	63.6%	31.1%	25.3%	73.9%	44.0%	32.0%	33.7%
15+ years	1.9%	4.6%	1.1%	1.3%	0.0%	8.0%	6.4%	3.3%
Unknown	0.0%	0.0%	0.0%	0.2%	4.3%	0.0%	0.2%	0.2%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

**Stab wounds include both intentional and unintentional piercing and punctures.*

INJURY TYPE

*Patients Treated at Pediatric Trauma Centers
(3 Year Comparison)*

Injury Type	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Blunt	83.0%	78.5%	80.3%
Penetrating	4.0%	2.8%	2.8%
Burn	5.0%	8.5%	6.0%
Near Drowning	1.2%	1.6%	1.6%
Hanging	0.1%	0.3%	0.1%
Inhalation	0.3%	0.4%	0.7%
Ingestion	5.2%	6.8%	7.2%
Crush	0.1%	0.0%	0.1%
Snake Bite/Spider Bite	0.0%	0.1%	0.1%
Animal Bite/Human Bite	0.6%	0.7%	1.0%
Other	0.5%	0.3%	0.1%
TOTAL	100.0%	100.0%	100.0%

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

NUMBER OF INJURIES BY AGE

*Patients Treated at Pediatric Trauma Centers
(3 Year Comparison)*

Age	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Under 1 year	157	142	146
1 to 4 years	392	429	453
5 to 9 years	468	491	449
10 to 14 years	504	485	566
15+ years	28	55	55
Unknown	4	0	3
TOTAL	1,553	1,602	1,672

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

MECHANISM OF INJURY

*Patients Treated at Pediatric Trauma Centers
(3 Year Comparison)*

Mechanism	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Motor Vehicle Crash	21.4%	18.6%	21.8%
Motorcycle Crash	1.3%	1.4%	1.3%
Pedestrian Incident	14.5%	13.7%	10.8%
Gunshot Wound	1.4%	1.9%	1.4%
Stabbing*	1.6%	1.6%	1.5%
Fall	28.1%	27.1%	28.6%
Other	31.7%	36.6%	34.6%
TOTAL	100.0%	100.0%	100.0%

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

**Stab wounds include both intentional and unintentional piercing and punctures.*

NUMBER OF DEATHS BY AGE

*Patients Treated at Pediatric Trauma Centers
(3 Year Comparison)*

Age	June 1999 to May 2000	June 2000 to May 2001	June 2001 to May 2002
Under 1 year	5	3	3
1 to 4 years	9	11	15
5 to 9 years	7	10	6
10 to 14 years	5	5	9
15+ years	1	2	0
Unknown	0	0	1
TOTAL	27	31	34

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

NUMBER OF INJURIES AND DEATHS BY AGE

*Patients Treated at Pediatric Trauma Centers
(June 2001 to May 2002)*

Age	Number of Injured Patients		Number of Deaths	
	Total	Maryland Residents	Total	Maryland Residents
Under 1 year	146	142	3	2
1 to 4 years	453	430	15	15
5 to 9 years	449	427	6	4
10 to 14 years	566	549	9	8
15+ years	55	54	0	0
Unknown	3	2	1	0
TOTAL	1,672	1,604	34	29

Note: For pediatric patients that were treated at adult trauma centers, see Maryland Adult Trauma Report. Children's National Medical Center data include patients residing in Maryland and/or injured in Maryland.

CHARLES McC. MATHIAS, JR., NATIONAL STUDY CENTER FOR TRAUMA AND EMERGENCY MEDICAL SYSTEMS

The National Study Center for Trauma and Emergency Medical Systems (NSC), at the University of Maryland School of Medicine, is the primary research center of the Maryland EMS System. The NSC collaborates with federal agencies, academic institutes, and governmental groups in projects focused on injury epidemiology, injury prevention, and improvements in the prehospital and in-hospital delivery and coordination of trauma care. Colin F. Mackenzie, MD, is the Director.

The National Study Center for Trauma and Emergency Medical Systems (NSC) is a leading participant in two multi-center studies of injuries sustained in vehicular crashes, the Crash Injury Research and Engineering Network (CIREN) and the Crash Outcomes Data Evaluation System (CODES) Data Network. To date, 249 patients have been enrolled into the CIREN study, a multi-center collaboration of nine trauma centers. Presentations about this research have been made to the National Highway Traffic Safety Administration (NHTSA) addressing older drivers, lower extremity injuries, and traumatic brain injury.

The NSC is one of ten CODES centers that provide data to NHTSA. During FY 2002, CODES data were used in projects that were presented at several national and international conferences. Among these projects were presentations associated with injury severity scores, older driver characteristics, and psychosocial outcomes. Recent efforts have also been made to examine injuries sustained in crashes where air bags deployed successfully. This CODES study showed that, while resulting in survival, air bags are associated with high morbidity. International media showed interest in NSC presentations at the 6th World Conference on Injury Prevention and Control held in Montreal in May 2002 and focused news articles on these results and the NSC researchers responsible.

The primary results of a follow-up study of the 10-year mortality rate among 27,000 trauma patients funded by the Robert Wood Johnson Foundation were published in the November 2001 issue of the *Journal of Trauma*. Further analyses of these data, regarding the relationship between injury severity upon admission to a trauma center and the risk of death from subsequent injury, were accepted for presentation at the 4th International Conference on Measuring the Burden of Injury held in Montreal in May 2002.

In March 2002, researchers at the NSC were awarded a second grant from the Robert Wood Johnson Foundation. Funding is being provided under the Foundation's Substance Abuse Policy Research Program in support of an assessment of motor vehicle crash culpability relative to alcohol and other drug use by injured drivers. The project will be funded for two years.

Over 400 patients have been enrolled in a four-year clinical trial of brief intervention of trauma patients identified as alcohol dependent. This trial is funded by the National Institute of Alcohol and Alcohol Abuse. The study hypothesis is that a personalized brief intervention will result in decreased drinking and consequences (including injury episodes) from alcohol abuse. Follow-up interviews at six months and twelve months post-discharge are underway.

NSC investigators are focusing on traumatic brain injury as part of several ongoing projects. A study funded by the Centers for Disease Control (CDC), in collaboration with the Maryland Department of Health and Mental Hygiene, is being conducted to analyze the incidence of brain injury in the state of Maryland. In conjunction with this project, Academic Emergency Medicine has recently accepted the results of a study describing factors that influence hospital admission among children with a traumatic brain injury. In addition, as part of the CODES project, researchers are investigating the types of brain injury resulting from different kinds of vehicular crashes. In collaboration with faculty at Kernan Hospital, NSC staff are creating a database that links prehospital and inpatient data with outcome data from Kernan Hospital.

A study of alcohol and other drugs from the NSC's database of over 53,000 patients with substance abuse for a 16-year period was published in September 2001 in the *Journal of Trauma*. Data from another NSC study of motorcycle fatalities were accepted for publication in the *American Journal of Public Health*. These findings were also presented to the Maryland State Legislature in support of non-repeal of the motorcycle helmet law.

During FY 2002, NSC researchers continued work on the annual "Crash and Injury Fact Book," which has been developed with support from the Maryland Department of Transportation. As part of this effort, the incidence and severity of motor vehicle-related injuries are being documented statewide. These data are available on the NSC web site (<http://nsc.umaryland.edu>).

The Human Factors & Technology (HF&T) Group of the Department of Anesthesiology is working collaboratively with NSC on several projects funded by the National Institutes of Health, the Department of Defense, and the National Science Foundation. These collaborating projects investigate potential uses of several types of telecommunication technologies in field and transport care. For example, one project is the integration of wireless mobile communication components into a system that provides reliable and robust transmission of multimedia diagnostic information from ambulance crews to receiving physicians, logistical control centers, and other experts. In another project, digital ambulances in the ExpressCare ambulance system are being used to automate the transmission of global positioning system data and the arrival time of the ambulances at the University of Maryland Hospital. These digital ambulances are also utilized for cardiac patients transferred for cardiac catheterization. The potential benefits for this proof of concept trial are that drug therapy can be initiated or adjusted en route. The catheterization team, whether it is at night or daytime, can be better coordinated and prepared for patient arrival. Several applications of such field- and transport-based audio, video, and data access are being considered, including mass casualty scene command, en-route diagnosis of acute stroke, and decisions regarding transport of trauma and seizure patients.

The HF&T Group worked with the Fire Department at BWI Airport and clinicians in the R Adams Cowley Shock Trauma Center to test a head-mounted wireless imaging system to assist in remote monitoring of both disasters at the airport and first responder management. A simulated mass casualty incident was carried out using the prototype system to broadcast video from the incident site to the MIEMSS coordination centers and receiving hospitals.

The NSC received a contract from the Army's Telemedicine and Advanced Technology Research Center (TATRC) to carry out a study entitled "Telemedicine in War and Peace." This project had two portions. The first, based on work carried out earlier in the Shock Trauma Center in the areas of distributed decision-making, examined potential uses for telemedicine systems and distributed decision-making in emergency settings within the military. This portion of the study resulted in several recommendations that should materially improve future use of distributed decision-making in emergency situations. The second,

based on an extensive series of field studies throughout the U.S. military installations in Europe and the Balkans, examined the human factors issues which impact on the currently limited use being made of the extensive U.S. military telemedicine network in Europe. It was determined that although the technological aspects of telemedicine implementation within the U.S. military in Europe have been well handled, the human factors, training, and maintenance issues necessary for full incorporation into routine clinical practice have not been adequately addressed. Specific recommendations for dealing with these issues were developed and presented to the U.S. Army.

The NSC, University of Maryland Schools of Medicine and Nursing, and TATRC co-sponsored a symposium, "Medicine, Technology, and Human Factors in Trauma Care: A Civilian and Military Perspective," in November 2001. This symposium was divided into three multidisciplinary sessions over two days in which innovations in organization, coordination, data capture, use of technology, and new approaches in emergency care of the injured were discussed. Military and civilian physicians, field care providers, nurses, psychologists, computer scientists, technologists, and human factor engineers presented. The symposium proceedings are available on the Web at <http://nsc.umaryland.edu>. The NSC also sponsored visits from University of Texas investigators for the development of a collaborative proposal between NSC, MIEMSS, the R Adams Cowley Shock Trauma Center, and the University of Texas to gather prehospital data.

The NSC Board of Advisors met twice this year to review current programs and provide guidance to the NSC Director about current and future initiatives of mutual interest, such as collaboration with State, Baltimore City, and University of Maryland initiatives in homeland defense and public health including injury surveillance.



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MARYLAND INSTITUTE FOR EMERGENCY MEDICAL SERVICES SYSTEMS

Robert R. Bass, MD, FACEP

Executive Director

653 W. Pratt Street

Baltimore, MD 21201-1536

410-706-5074

Website: <http://www.miemss.org>



Maryland Institute for Emergency Medical Services Systems
653 W. Pratt Street • Baltimore, Maryland 21201-1536